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EDITORIAL

The editors are pleased to report that our recent subscription campaign was successful and that the Review is alive and well. It is most reinforcing to know that the objectives of the Review are endorsed by the profession.

As you know, the Review was initiated three years ago. Its purpose was then, and remains, to serve as an advocate in shaping the quality of research in art education by providing post publication critiques of research undertaken in the field. To date, reviews of approximately fifty research documents representing work done at more than twenty graduate facilities have appeared in the Review. In an attempt to provide a perspective on some of the problem areas found in these documents, the editors recently reexamined these reviews, taking special note of deficiencies frequently identified by reviewers. Two closely related areas emerged from this examination, and in our view merit serious discussion among doctoral advisors. One area dealt with the overall absence of quality in the dissertations; the other dealt with inadequate supervision of dissertations provided by doctoral committees. In our view these observations are not limited to the documents reviewed in this publication.

There is general agreement among critics of research in art education that much of the work in the field fails to meet generally acknowledged levels of competence for research using the scientific method, and it should be noted that most of the doctoral dissertations done in the field use quantitative methods. Of course, such claims are not uncommon in fields where quantitative research is in its formative stages. For example, in this issue, Leonard and Colwell point to similar problems in research in music education. Our reflections on the possible causes of these and related problems quite naturally lead to considerations about: (a) the quality of doctoral candidates; (b) the content of graduate programs; (c) the sophistication of research support systems (libraries, computer facilities, cognate departments); and perhaps most importantly, (d) the level of expertise and amount of operational research experience represented by members of the doctoral committees responsible for supervising dissertations.

Obviously, the profession must seriously reevaluate the process of training researchers. Advisors and students alike must be well grounded in the foundations of behavioral research and be knowledgeable about high priority content for research in art education. Considering that opportunities for employment for art education doctorates will be less extensive during the next decade, graduate programs must take steps to insure that students that populate doctoral programs are the best and the brightest. Further, if the dissertation is to be a scholarly

contribution to knowledge in the field, and it is generally acknowledged that the doctoral dissertation represents the only serious attempt at research that most art educators undertake during their professional career, members of the doctoral committee must demand that only dissertations clearly meeting generally acknowledged levels of competence be accepted.

Finally, this issue introduces a new section entitled Arts Research Summaries. The purpose of this section is to provide the reader with summaries of current research activities in the various arts. In order to establish some background for this section, the next few issues of the Review will feature a series of state of the art overviews of research in the individual arts. The first article in this series by Leonard and Colwell is an edited version of a paper originally prepared for the Aspen Conference sponsored by CEMREL and the Aspen Institute in Humanistic Studies. In our view, this carefully prepared paper provides a comprehensive and mature perspective on the status of research in music education and will be of considerable interest to researchers in art education.

GWH/TZ

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INTEGRATIVE REVIEW

THEORY AND RESEARCH IN PERCEPTUAL LEARNING RELATED TO ART EDUCATION

Rex Dorethy
Ball State University

Most interest and consequent research in art education related to perceptual learning has stemmed from the early work of Lowenfeld (1957), the reasoning of Arnheim (1964), and the research synthesizing efforts of McFee (1970). Some advances in our accumulated viewpoint have accrued through these and subsequent studies from the standpoint of stimulated interest and classroom practice. The uncoordinated direction and theoretical dilemnas created by much of this investigation has, however, left substantial gaps in our knowledge concerning visual perception and its relation to the art learning process. Due in part to the propensity of researchers within a discipline to recreate the theoretical positions of their mentors, and also to depend heavily upon partial viewpoints popularized from other disciplines, much recent work in art education has held to the same limited theoretical bases. Confounding the problem has been the development of a significant body of research by experimental psychologists concerning factors which seem to affect the development of perceptual learning. Much of this information has been ignored by researchers in art education.

The purpose of this integrated review is to: (a) briefly critique some of the basic theories of perceptual learning upon which studies in art education are often based; (b) to summarize the research generalizations which may be made at this time; and (c) to review pertinent experiments which hold promise for research in our field.

In research and in education, theory is meant to be a useful and reasonable guide to action. Theory usually begins with a set of plausible ideas which describe empirical situations and also tends to be subject to refutation or verification by empirical testing. In their best form, theories are systematically built, tested for internal consistency, clarified in terms of critical variables, and controlled for extraneous influences. The theorist also seeks and tests for relations among phenomena. Most useful research begins with a theoretical basis and proceeds through logical deduction and hypothesis development to rigorous testing of the original theoretical belief. In theory building, metaphysical explanations, those which cannot be tested, are ruled out. Theory which cannot be tested is of limited value and may not be theory at all. Theories which survive the rigors of testing tend to be powerful as well as useful (Kerlinger, 1964).

For classroom practice, satisfactory learning theory requires at least two levels of elaboration. First, such theories need to point out what is learned, and secondly, usable theories tend to elaborate the principles for learning. If complex learning is to be obtained, ordering the learning principles from simple to complex may be required. Key points and operational definitions implicit in the theory need explication, and rigorous, systematic experimental studies which isolate causal factors will be needed for verification purposes.

The haptic-visual theory (Lowenfeld), the whole-to-parts differentiation theory (Arnheim), and the perception-delineation theory (McFee), are all inferred explanatory processes. The productive mechanism for each was inductive logic. Each tends to go beyond information given and each requires verification. What is learned, hence teachable, is largely ignored. Consequently, perceptual learning theory in art has received more attention by way of explanation about what is or what occurs, than by way of description of how learning occurs or what is learned. Since content centers on what can be learned, if teaching is to occur learning theory must delineate salient aspects of the learning process. Given this viewpoint of learning theory, individual examination of several theories of perceptual learning or development will be useful.

The Lowenfeld Haptic-Visual Theory of Perceptual Development. Lowenfeld's viewpoint is the oldest of those reviewed, and encompasses personality development in the form of self concept, mental health and creativity (Lowenfeld, 1957). Perceptual development is seen as a pervading influence in the theoretical framework of these factors.

Gestalt psychology, the notions of John Dewey, child developmentalists and certain positions of the progressive education movement form much of the value basis for Lowenfeld's work. In this instance, perceptual development is seen as inherent with the child, and adult influences may stifle the child's impulses. Lowenfeld emphasized sensory experience as the primary means of perceptual development, and saw the teacher's task as that of arranging conditions so the whole potential of the child could develop. Hence, the emphasis was on allowing perception to develop, a somewhat passive role for instruction.

The basis for much of Lowenfeld's viewpoint concerning perceptual performance stems from his haptic-visual investigations (the term investigation is used advisedly here since the so-called experiments were actually ex post facto investigations). The difference between investigation and experimentation is control. Cronbach offers the notion that an experimenter is a puppeteer, while an investigator merely observes a play where Nature pulls a thousand strings (1975). With Lowenfeld, the visually oriented subject is said to respond to the perceived array by recording the objective qualities of stimuli, depending mainly upon vision. Visual subjects tend to produce art which is representational and lacking in physiogonomic or kinesthetic quality. The haptic, conversely, approaches space with an orientation that is kinesthetic and emotional. Touch, rather than vision may be important. Haptic subjects tend to portray their feelings rather than visual aspects of the environment.

With regard to children's spatial development in art, a basic aspect of Lowenfeld's position is a somewhat rigid hierarchy of developmental stages. These stages are systematic and unfold maturationally as though genetically controlled, an argument stemming from the German psychologists. Lowenfeld's work in this area is filled with admonitions for which little experimental evidence exists. He states for instance, that: (a) "the first origin of the base line is the kinesthetic experience of moving along a line," (b) catalogs age 7-9 as "the first definite space concept: 'base line', and (c) argues that posing analytic art problems for children restricts their freedom of expression (1957, pp. 142-171). These (and other) assertions concerning children's spatial abilities have developed inductively at points, and have been fixed a priori as truth in the methodology of art education largely by attendance to tenacity and authority. The self-corrective methods of scientific thought are often missing in this argument. Later research suggests contrary findings. For instance, 60% of the four-year-olds in one study were base line users (Dorethy, 1965). Similarly, Gibson, among others, suggests transitions in perceptual development rather than the abrupt changes in behavior implied by categorical stages (1969).

To verify his beliefs, Lowenfeld devised a series of five tests which were claimed to measure the tendency of a subject to orient himself to one or the other of these genetically based polar styles of perceiving (1945). The tasks deal with word responses and form recognition, with art having little emphasis. The tests indicated that about 70% of the population orient themselves haptically or visually. Classification of the remainder was indefinite, raising questions of variability. While the tests are interesting, their validity is open to question. Published information relating to the test construction techniques is meager, making criticism or acceptance difficult. These tasks do not have the benefit of correlational data, nor do the procedures lend themselves to replication (in one instance, "air force cadets" are the sample, but no other distinctions are made). Statistical analysis in these investigations is minimal, and one may question the validity of data developed where chance factors are not recognized. Additionally, the variables which may account for haptic or visual perception are never controlled for, and so the art teacher cannot be sure that these characteristics are inherent. Controlled experiments would be a valuable addition to the haptic-visual notion for these reasons. Lowenfeld felt that his tests proved haptic-visual tendencies. Contemporary psychologists would be more cautious.

The haptic-visual position has enjoyed wide appeal as a philosophic basis for art education. Its worthiness as a useable perceptual theory, however, is questionable since theory demands further experimentation and verification. Much of Lowenfeld's writing shows a metaphysical bent (it cannot be tested by present means) and its use in learning situations is therefore questionable. Developing teaching strategies from an already tenuous base invites further difficulties. Observation served as the basis for many inferences contained in this orientation and bias may be a factor. What is learned perceptually tends

to be lost to the rigid criteria of developmental stages and haptic-visual orientation. The mechanics of perceptual development are not made clear and the requirement of noninterference seems to severely limit the teacher's role in children's learning. Contemporary studies in perceptual psychology enjoy tighter control and verification; and investigators dealing with sensory experience, learned differentiation and practiced perceiving suggest a more dynamic role for the educator (Held and Richards, 1972). Recent studies in art education also propose an important role in accelerating perceptual abilities (Salome, 1965; Rennells, 1969; Dorethy, 1973), and suggest that concepts such as distinctive features, motion, time and space can be contributing variables for learned modification in artistic functioning. The implication is that perception can be learned and restriction of individual development is not an insuperable problem.

The Arnheim Differentiation Theory of Perceptual Development. Arnheim's theory of perceptual development is strongly Gestalt based in that the processes of perception are held to be given at birth and proceed maturationally towards increased differentiation (Arnheim, 1964). Perceptual development is inherent in the organism and not dependent upon environmental stimulation. Differentiation may be viewed as ability to segregate and isolate visually pertinent data. Perception is thought to proceed from gross wholes towards finer distinction of the parts making up the whole. Simplified children's drawings are held to be a product of limited perceptual ability and not merely a lack of motor skill. Children draw what they see, and they see less than an adult.

Much of Arnheim's writing is directed as an attack on the Intellectualist position that children draw what they know. Little attempt is made to attend to the influences of cognition or learned modification of perceptual data, and cultural or environmental influences are largely denied. This distinction is not surprising when one realizes that some of the early Gestalt writing was directed at overcoming the Empiricist's viewpoint of learned abilities (Koffka, 1935). Conversely, modern psychology abounds with experimental studies which tend to refute or render suspect the rigid Nativist tradition of Gestalt psychology, although inherent capacities for perception are not disregarded (Noton and Stark, 1972).

The notion of maturational development with Arnheim is somewhat contradictory since he holds that each stage of perceptual development is dependent upon successive stages. He admits, however, that children may skip or linger with stages of drawing development. Since theory, in this case, is derived mostly from ex post facto examination of drawings, causal factors concerning individual differences in art remain open to question. The potential for improving art work is also neglected since Arnheim feels that instruction is inappropriate. What is developed (learned?) is differentiation. Increasing analysis of visual structure is what is differentiated, but the means of analyzing visual structure are not delineated. The mechanism by which learning might enhance differentiations therefore is not elaborated.

Arnheim's theory is logically consistent, although its inductive qualities tend to go beyond the information given by ignoring some obvious problems. Arnheim is also one of a few perceptual theorists to address himself to the problems children encounter in rendering a three-dimensional world on two-dimensional surfaces in art. The notions inherent in this theory, however, are not experimentally grounded nor are they tested, except through observation, a process greatly subject to the observer's bias. Arnheim's theory is an interesting concept of children's perceptual development in art, albeit a problematic one.

The McFee Perception-Delineation Theory. McFee also views perceptual development as a primary element related to the art experiences of children (McFee, 1970). The perception-delineation (P-D) theory is a broad-based explication of many factors thought to be determinants in the development of artistic behavior.

Six interacting points are cited as explanatory of what takes place:

1. Readiness
2. Psycho-cultural transactions
3. Visual-physical environment
4. Information handling
5. Creative delineation
6. Evaluation of feedback and transfer

Point One refers to the overall cognitive readiness of the child to respond perceptually and conceptually. Point Two concerns held values, prior attitudes, and new information presented in the classroom; in brief the psycho-cultural transaction of the child and his environment. The teacher may manipulate these variables to foster more learning. Point Three refers to art, man-made and natural things from the complex of the visual-physical environment. Included are the affective, structural and symbolic qualities of the visual arts, as well as past experiences from the environment. Point Four is concerned with the child's overall habits of information handling. The teacher's place is to assist in the integration of new information handling. Increased percepts and concepts should result, and the expanded capacity is felt to allow more alternatives for creative problem solving and art sensitivity. Creative delineation, Point Five, concerns symbol usage for communication of perceptual and conceptual responses to experiences by designed expression. In short, the making of art. If the response is to existing forms, delineation may involve analysis and abstraction of the message or the affective qualities, with the structure of the message conveyed ideationally about the work of art. Point Six refers to the feedback information the learner gets from his own responses, and may contain information that alters readiness and ability to transfer learning to succeeding tasks.

McFee argues that learning is seldom an isolated event, and emphasizes that certain theory points are interacting. The ordering of the system s aimed at teaching concerns and not at age based maturational development. McFee recognizes the existence of developmental occurrances, but suggests great overlap and flexibility of stages.

Some evidence hints at a cyclic character in the theoretical points described, the former affecting the latter and vice-versa. In this sense the perceptual process is viewed as a sensory-behavioral loop. For instance:

> A child with a given readiness has an experience in an environment from which he selects what is meaningful and integrates it into his past experience according to his cognitive style and personal-culture habits. From this assimilation he evolves a response - a perceptual image, a concept or both - from which he delineates an expression in words or in art; he may have an aesthetic reaction which is an internalized delineation of form and impact. Each experience he has, when carried through to a delineation of his responses, changes his readiness for the next related experience. It modifies his subsequent information handling and problem-solving abilities and gives him a broader basis for being creative. (McFee, 1970, p. 264).

While McFee cites perceptual tendencies which may be inherited, and discussed the perceptual differentiation process, her viewpoint differs from the previously discussed theories in several ways. This theory is synthesized largely from the research findings of several disciplines including art, psychology, anthropology, education, and social science. By emphasizing the interaction of culture, environment, and individual differences, McFee holds that perception is largely learned. Additionally, while the P-D viewpoint has been somewhat modified and expanded with additional research over several years, she also recognizes and calls for additional research verification.

McFee's viewpoint is interdisciplinary in that it is partially drawn from sources beyond art. A deliberate operational attempt was made to select child-oriented data which appeared related to art behavior and which amplified awareness of the potential range of individual differences involved in responding to visual art. Studies relating to early childhood experiences in the environment were given particular attention. In this regard, the perception-delineation theory is a reaction to the limitations of some previous notions. The position is selective since what was felt to be pertinent data was extracted at the possible expense of conflicting information, a not uncommon practice among educational theorists. McFee does cite several prior theories concerning perceptual development in art, however.

The data on which the theory is based is also primarily investigative and not experimentally based, so being ex post facto in character, it does not tend to isolate or explore causal factors for what was observed. To develop the theoretical connections, McFee must therefore infer beyond the information given. For that reason, experimental studies of verification and correlational efforts would be a useful addition.

An eclectic methodology of this type may attempt consistency, but also results in a broad viewpoint that tends to be ambiguous at times. Point by point, the theoretical development displays considerable overlap. Readiness is a salient factor in each of the first five points, for instance, suggesting that a

potentially different format or frame of reference might elucidate the system. A case may also be made for the position that this expanded notion of perceptual data processing tends to confuse or ignore what is learned in perceptual learning; a problem which McFee apparently recognizes but attacks with generalities in the form of concepts, goals, and objectives. Differentiation is a concept. Assuming that similarity, proximity, closure and the like are principles of perceptual organization, as McFee does, the question of what is learned remains. Does one learn contrasts, relations, patterns, or something else? If learned distinctions among visual stimuli are made, then categorized into class concepts, what is learned is something beyond concepts. When objects moving in time and space are observed, surely something more than mental images are learned (McFee, pp. 251-254). In a theory of perceptual learning, one would hope for a concise schematic rendering of conceptual/perceptual skills describing discrimination learning around which content could be developed. Perceptual differentiation consists largely of increased discrimination of visual data. This subject is somewhat lacking and may be a primary reason for the urging of research verification and investigation of causal factors affecting art learning. In this regard also, McFee is unique among the theorists previously critiqued.

An interesting aspect of the perception-delineation theory is that it appears future-oriented, concerned with what learning and teaching may yet accomplish. The general contribution of the P-D theory for art education, however, is the assertion of environmental, cultural, and learning effects on perceptual responding in art. In this view, the teacher is seen as a pervasive and positive influence. A basic technique in the theoretical development was the deliberate seeking of relationships and causal factors explicated by research. Inductive logic is applied here, as in previous theories, but the projective notions in this case are complimented with recognition that more experimental research is required. The perception-delineation theory, therefore, is apparently not viewed as a closed issue. Research verification of the operational definitions and theoretical structure used therein may eventually be realized, but at present the P-D viewpoint is best described as comprehensive, open to question, and yet illuminating. Theoretical development of perceptual learning in art will be served by this base, but will also need to pay attention to what is learned and the ordering of learning principles.

A Psychologist's Viewpoint of Perceptual Learning and Development. More complete theories of perceptual learning processes exist in the field of perceptual psychology. One of the more interesting and potentially useful of these viewpoints for art education is Gibson's (1969) notion of stimulus oriented perceptual differentiation. Perception, from this standpoint, is the process by which we obtain firsthand information about the world around us. It has a phenomenal aspect (the awareness of events presently occurring in our immediate surroundings), and a responsive aspect (entailing discriminative, selective response to stimuli in the immediate environment).

Perceptual learning refers to an increase in the ability to extract information from the environment, as a result of experience and practice with stimulation coming from it. This change seems to be in the direction of getting better information, since man has evolved in the world and constantly interacts with it. Learned differentiation begins at a very early age and becomes more selective and economical with maturity.

Processes are held to be basic for perceptual differentiation. Gibson refers to them as the mechanics of perception: (a) abstraction of different properties in perceived stimuli; (b) filtering out of irrelevant variables unnecessary to the task at hand; and (c) selective attention, such as exploratory activity of sense organs.

Perceptual search appears to be activated or motivated by several factors, all of which serve to direct the individual's attention. In this area, Gibson identifies and defines personal attitude, task, cognitive motivation, autistic factors, and cultural bias as affectors of perceptual learning.

Given variables which seem to motivate visual perception, what is learned in perceptual learning? The criterion for perceptual learning is specificity, the internal reduction of uncertainty. The products of the search have the property of reducing the information to be processed. Perception is thus active, adaptive, and self-regulated. What is learned appears to be: (a) patterns, as in transformations of melody; the pattern is the same, but the notes different; (b) properties, or the dimensions of difference; and (c) distinctive features, such as relations, values and contrasts. The learning of invariants (the ratios and proportions which do not change even though an object may move, or an event may occur over time and space) is held to be a primary factor in the perception of events which appear to undergo transformation.

Operating from this base, Gibson outlines six propositions as principles underlying learning in perception. Each of these notions seem important where visual/cognitive enterprises such as art are undertaken. In learning to discriminate form in multi-dimensional learning tasks, the following points are highlighted:

1. Emphasize the dimensions of difference between members of a set of stimuli.
2. Learning distinctive features facilitates learning.
3. Learning of differences is facilitated by providing graded examples of contrasts so as to define and isolate the critical variable with gradual changes.

In predicting discrimination performance, assuming previous learning of distinctive features has taken place, Gibson offers experimental evidence indicating that:

4. Discrimination is best when feature differences are maximal (Yonas and Gibson, 1967).
5. Discrimination is best when distinctive features are enhanced in a stimulus display (Ryan and Swartz, 1956).
6. New stimuli in a class of objects with familiar distinctive features should be more easily discriminated from one another than an equivalent set without familiar distinctive features (Gibson, 1963).

Perception, then, is seen as an active differentiation process in which the organism searches for, and extracts information from the available stimulation that has not already been detected and utilized. This process may proceed as a system in ordered arrangement, a hierarchy, such as: (a) discrimination, at first we distinguish the differences between two sets of stimuli; (b) recognition, we begin to recognize the correct stimuli on successive tasks as being the original stimuli; and (c) production, being able to reproduce stimuli.

Visual perception, from this standpoint, may be seen as a high level cognitive enterprise, structured and controlled in an important way by sensory experiences with the environment. Productive and perceptual learning efforts in art seem closely related to the theoretical dimensions cited by Gibson. The learning and production of sensory arrangements could also be one of the most important undertakings for education in general, since some research evidence indicates that without such experiences, learning may be severely deprived, and may not occur at all (Held and Hein, 1963).

Curriculum and specific lesson content in the visual productive art processes could be developed utilizing the above notions of the mechanics of perception, sensitivity to factors governing perceptual search, attention to what is learned in perceptual learning, and emphasizing the distinctive features present in art forms, materials, and the visual environment. Increased sensitivity to environmental variety and increased differential response might hold rewards for increased aesthetic and creative productivity.

SUMMARY

Lowenfeld then, has suggested that perceptual ability is biogenic, inherent in the organism, and that learning is best left to natural means. Arnheim, operating from a similar naturalistic viewpoint, has emphasized increased differentiation as a correlate of maturation. McFee has viewed environment as a causal factor for increased perceptual modification and suggests that learning in art is a continually changing sensory-behavioral system. In each case, and properly, inference is a primary theoretical mechanism, but additional experimental research is required to systematically delineate cause and effect. While some attention has been given to response styles in artistic perceiving, little is known concerning the learning modes affecting perceptual response through art. For research, more useable theoretical constructs are to be found in the field of perceptual psychology.

In addition to the foregoing, three additional comments may be made about the Lowenfeld, Arnheim and McFee theories. Initially, as in most traditional learning prototypes, the existence of prior capabilities is slighted or ignored in most of these theoretical descriptions. Secondly, the assessment of primary capabilities which may play a sequential role in determining subsequent learning has been largely ignored by art education theorists interested in the subject of perceptual performance. Thirdly, the presense of a performance does not make it possible to conclude that learning has occurred. It is necessary to show that there has been a change in performance. Further, the possibility exists that many varieties of perceptual learning in art may exist which may eventually become delineated by describing the necessary factors comprising learning conditions.

Nevertheless, learning variables relevant for experimental study of perceptual performance in art would seem to be: (a) assessment of what capabilities play a part in determining subsequent learning; (b) evaluation of the initial capabilities of the learner; and (c) determining the stimulus conditions for learning existing outside the learner. Examination of theoretical constructs relevant to these general problems may hold fruitful direction for continuance and verification of the preliminary theoretical positions discussed here. The major issue, however, remains that of refining the theoretical basis of operations relevant to perception in the visual arts.

Over time, theories of perceptual learning relevant to art education appear to be evolving from simplistic notions describing children's art endeavors to comprehensive viewpoints which consider the variety of factors which may affect perceptual growth. No complete theory of perceptual learning presently exists in art education, or for that matter, in perceptual psychology. Increasing attention, however, is rightly being paid to data from other disciplines, but there is some risk involved, since the data may not directly apply to art efforts. This generalized research knowledge may aid in establishing conditions for initial learning, but how to continue at higher levels of human performance such as invention or creativity remains clouded. Similarly, aspects of personal interaction between the teacher and student, such as motivation, persuasion, or establishing attitudes and values remains problematic.

Despite the relative infancy of serious research in the field of art education, there is encouragement from the standpoint that contemporary experimental research in art education has already tended to lend credence to some of the general parameters discussed above.

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REVIEWER

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A DEVELOPMENTAL STUDY OF THE CRITERIA USED BY CHILDREN TO JUSTIFY THEIR AFFECTIVE RESPONSE TO ARTS EXPERIENCES

Dennis Thomas Murphy, Ph.D.
Hofstra University, 1973

ABSTRACT

The purpose of this study was to determine what critical criteria children in ages 6-18½ use when they are asked to justify their affective response to arts experiences. Written verbal responses to two different arts experiences, an opera and a slide reproduction of a painting, were gathered from children who had been classified into the four age groups of: 6-7½, 7½-11½, 11½-15½, 15½-18½.

In analyzing responses to the two experiences, the investigator attempted to determine, through content analysis, if the variety of critical criteria children used changed from age group to age group and if the response patterns within each group changed from one experience to another.

Six hundred thirty-one children from the Mineola Public Schools responded to written questionnaires after attending an opera and after viewing a slide reproduction of an oil painting. The two sets of responses were submitted to content analysis procedures using a category system derived from aesthetic criteria suggested by Harry Broudy. The categories were: communication, extra-aesthetic function, expressive elements, formal properties, general perceptual interest, sensory elements, subject matter, technical competence. A ninth "idiosyncratic" category was used to categorize verbal responses that were unintelligible or which were unsupported by aesthetic criteria.

To determine if older and younger children used different criteria in their responses, sixteen Chi Square analyses were performed for each of the eight critical categories. Differences were found between the proportion of older and younger children using a particular category. A greater proportion of older children used categories of formal properties, communication, extra-aesthetic function and general perceptual interest than younger children in responding to opera and painting.

In responding to the opera, a greater proportion of younger children used the subject matter category. In responding to the painting, a greater proportion of older children used this category.

There were no differences between the proportions of younger and older children using categories of expressive elements and technical competence when they responded to opera and painting.

To determine if older children use a greater variety of critical categories than younger children in their response to arts experiences, and if the pattern of this response changes from one experience to another, a repeated measures analysis of variance design was used. In the analysis, factors A (age groups), B (arts experience) and the interaction of A and B were found to be significant at p .01. To explore the nature of the interaction, a follow-up, Analysis of Variance for Simple Effects, each age group for each art experience, was performed. The interaction was plotted in graphic form and posteriori comparisons between means were made.

The analysis revealed that there were no differences between age groups in the variety of critical criteria used when responding to an opera.

In responding to a painting, older children (ages 11½-15½ and 15½-18) used a greater variety of critical criteria than younger children (ages 6-7½ and 7½-11½) in their verbal response to painting.

In comparing the mean number of responses of children within the four age classifications across the two art experiences, it was found that children in age groups of 11½ and 15½ and 15½ and 18 used a greater variety of critical criteria in response to the slide reproduction of the painting than they did in response to the opera.

Order No. 74-672, 140 pages.

REVIEW

Hilda P. Lewis
San Francisco State University

Statement of the problem. The study asks a simple and straightforward question: Is there a difference between older and younger children in the type and variety of verbal explanations offered for liking or disliking a work of art? The answer has to be yes. Differences in linguistic competence and level of cognitive functioning between school beginners and advanced students would make any other finding suspect. This answer alone would hardly constitute a contribution to knowledge and Murphy goes on to add another dimension. He casts the verbal explanations into a hierarchy of aesthetic categories, relating it to Piaget's developmental levels. The expectation, then, is that lower level statements of aesthetic justification will be found among subjects whose ages suggest they are at the preoperational or concrete operational stages; higher level statements of aesthetic justification would be found at the stage of formal operations.

Murphy says that his problem is important to the field because curriculum developers need information about children's ability to respond to art forms; children's talk about the arts can offer evidence of cognitive functioning; the ability and disposition to make informed choices are needed to act rationally under sensory bombardment aimed at manipulation of the citizen-consumer.

Related research. Murphy touched on research from four different groups: (a) the futurists, (b) aesthetic philosophers, (c) Piagetians, and (d) arts educators. He uses statements by futurists to establish a need for teaching children to use rational criteria in decision-making as a defense against control through excessive visual and auditory stimulation. He summarizes studies in art education that are similar to his own, noting that they are generally limited to the visual arts, thus establishing the uniqueness of his study. His treatment of this research is rather cursory. He does little by way of analysis, comparison, or criticism of studies. However, since his purpose here seems to be to justify his undertaking, a cursory treatment may suffice.

The theoretical foundation of the study is in the attempt to cast criteria of aesthetic judgment into Piaget's framework of developmental stages. Murphy reviewed the aesthetic criteria proposed by Sibley, Beardsley, Aldrich, Pepper, and Broudy, reporting that Broudy's system proved most suited to the task. Murphy does not inform the reader of the nature of the proof other than to say that the alternatives were too generally defined, at different levels of discourse, or more clearly applicable to the critical verbal responses of adults than of children. As it turned out, Broudy's criteria did not fit the data too well. It might have been more sensible to develop categories children use in talking or writing about art from their own discourse rather than trying to match their talk to that of aestheticians and art critics.

Broudy's categories consist of eight factors: sensory elements (sound patterns, color patterns, shapes, gestures, etc.); subject matter (knowledge about the artist and the work); expressive elements (human qualities such as loneliness, grace, serenity, energy, etc.); technical competence; general perceptual interest (ability to capture and sustain attention); extra-aesthetic function (utilitarian purposes, patriotic appeal, religious meaning, etc.); communication (the message the work transmits); and formal properties (harmony, balance, centrality, development). These categories are of higher and lower orders. The category, sensory elements, for example, is immediately available to perception. The formal properties category, however, requires analysis and judgment about how various elements of a work function together. Sensory elements and subject matter are rungs toward the bottom of the ladder, essential to moving higher up, but offering a very limited view. The higher levels require more experience with the arts. Murphy argues that older people have had a greater amount of time to accumulate this experience with the arts, and hence that Broudy's work suggests a developmental continuum.

It is at this point that Murphy falls into error. Obviously, all learning occurs with time, but the mere passage of time of itself is no indication that a given skill, knowledge or what-have-you has been acquired. For learning to take place the organism must be in a stage of readiness and the necessary experiences must occur. Piaget's work informs us that certain mental processes cannot be expected to operate below certain ages; he does not assure us that higher mental processes will necessarily appear by any given age for all individuals. Thus, we cannot assume that the ability to judge works of art in terms of formal properties will be found in young children, nor can we expect to find it in older children who have no experience in analyzing works of art in terms of the relevant qualities. Murphy tells the reader nothing about the arts education of the children in the study, although the Mineola Public Schools have had special funding for their arts program. In the final analysis, the introduction of Piagetian theory does not strengthen the theoretical framework of the study. One hardly needs a complex theory of child development to be persuaded that lower levels of cognitive functioning occur in younger children and higher levels in older ones.

Research objectives. Murphy's study focuses on four questions:

1. Do older children use different critical criteria than do younger children?
2. Do older children use more varied critical criteria than do younger ones?
3. Do the critical criteria used by older and younger children differ from painting to opera?
4. Does the variety of critical criteria used by older and younger children differ from painting to opera?

Murphy obviously expects that the critical criteria of older children will be more varied and sophisticated than those of younger children. He anticipates no differences between the two types of experiences in variety and kinds of critical criteria evoked.

Methodology. Students from the kindergarten through the twelfth grade were taken to see the opera *Gianni Schicchi* performed in English. Following the performance they were asked to check the statement that best described their feelings about the performance: "It was great;" "I liked it;" "I can't decide;" "I didn't like it very much;" "It was terrible." Next they were asked: "Why do you feel this way? Try to tell what it was in the performance that made you feel this way." Children who could not respond in writing, particularly 6 and 7 year olds were given taped interviews

Murphy reported that approximately 250 responses had to be discarded for reasons such as the lack of a name or the lack of an answer. He is very fuzzy on this point. First, his numbers do not balance out. Second, he reported that the sample that remained after the opera response constituted the sample for the study. Were there no responses to the painting experience that could not be used? Were there no absences to reduce sample size? Murphy's carelessness at this point leaves the reader uneasy about experimental control in other parts of the study.

The large number of discarded responses also casts doubt about the quality of the remaining responses. It is likely that children over the age of seven, assumed to be capable of a written response, also had difficulty with the mechanics of writing and their replies suffered.

The wording of the question was not such as to elicit a variety of critical criteria. The added direction, "Put down as many reasons as you can think of," might have resulted in a more accurate picture of the type of variety of criteria the children were able to employ.

Within a month following the opera performance the children were asked to respond in the same manner to a slide reproduction of Chagall's painting, *I and my Village*. It would have been better if half the group had responded to the painting some weeks before the performance and the other half some weeks after the performance in order to control for the practice effect.

The study does not report the way in which the opera performance and the slide viewing were introduced to classes. The investigator should have provided teachers with instructions. A casual remark by a teacher, such as, "Today we are going to hear some beautiful music," might be echoed in the children's explanation of why they liked the opera.

Responses were content-analyzed using Broudy's eight critical criteria plus a ninth category, idiosyncratic, for the responses that were unintelligible or unsupported by aesthetic criteria. Three judges - an art educator and a music educator trained to use this system of content analysis, and the investigator - classified the data into the nine categories. Interjudge reliability on the number of different categories employed was high, .93 for opera, and .99 for painting. However, agreement among the three judges on the appropriate category was not as high; .72 for opera and .70 for painting. The statements, it seems, did not fit clearly into the categories. The judges believed that categories could be subdivided because they detected different cognitive levels within the same class of responses.

Judging should have been "blind." That is, judges should have had no clues as to the age of the respondent. Examining the original papers must have provided strong indications as to whether the work was that of an older or younger child. Judges might have unintentionally classified debatable responses into a higher category if it was assumed to come from an older child and into a lower category if it was assumed to come from a younger one.

The difficulty in fitting children's words into Broudy's aesthetic criteria is evidenced by the investigator's own inconsistencies. For example, on one page of the scoring guide the statement, "The actors are good," is classified as sensory elements. Two pages later in the scoring guide the statement, "The actors were very good," is offered as an example of the technical competence category.

Results and discussion. Murphy's findings are stated in his abstract. There are, however, revelations in his data that he does not point out. As would be expected, a greater proportion of older children used categories of formal properties, communication, and extra-aesthetic function, which require going beyond what is immediately visible in the work. However, the actual numbers of older children using these categories was small for painting and infinitesimal for opera. But the number of younger children using these categories was infinitesimal for painting and zero for opera and so the differences were found to be significant. Although older children used higher order categories they also used the general perceptual interest category more frequently than younger children; that is, they justified their reactions without reference to aesthetic criteria. What is most interesting in the responses is that for older and younger children the three most frequently used criteria for both painting and opera were the three weakest ones: (a) subject matter, (b) sensory elements, and (c) general perceptual interest. Older children do not seem to be more inclined to justify their reactions by reference to aesthetic criteria. By combining the two categories which do not involve aesthetic factors - general perceptual interest and idiosyncratic - the proportion of such responses for opera among older children turns out to be .70 and among younger children it is .38. For painting the proportion among older children is .48 and among younger children .30. This is the opposite of what one would expect and flies in the face of Murphy's interpretation of Piaget as predicting that it would be the youngest children who fail most frequently to use aesthetic criteria. Actually when children are classified by ages corresponding to Piagetian stages the preoperational group (6-7½) had a far smaller proportion of idiosyncratic responses to painting .22 than did the 11½-15½ year olds who are presumed to be in the stage of formal operations, capable of adult logic and abstract thought .70. For opera the proportion of idiosyncratic responses varied little over the age groups.

It was evident that the quality of responses was better for painting than for opera. One wonders why. It may be that: painting elicits a greater response at all ages because children have greater exposure to painting than to opera; painting, as the second experience of the two, enjoyed the advantage of the practice effect; the long opera experience, involving travel, produced fatigue whereas the brief classroom painting experience did not.

Commentary. Murphy believes his study reports on the capabilities of groups of children. It does not. He has measured performance, not capabilities, of children whose relevant training is unspecified. The justification of an affective response to a work of art is a learned response. As Wilson has shown, the use of adequate aesthetic criteria is a consequence of training. There are, no doubt, limits to what may be learned at different ages but the present investigation offers no evidence as to what they might be.

Murphy explores the congruence between Piagetian stages and the use of aesthetic categories in the preoperational (6-7½ year olds), concrete operational (7½-11½), and formal operational (11½-15½) stages. He finds no distinction between the functioning of preoperational and concrete operational age groups with respect to the tasks of the investigation. The use of aesthetic criteria requiring higher mental processes occurs in the formal operational group but only to a limited degree. By no means does the use of sophisticated aesthetic criteria characterize the performance of this group or that of the oldest group studied (15½-18).

It would be interesting to learn how responses were distributed along the like-dislike continuum and whether enthusiasm is related to the quantity and quality of criteria used.

The present investigation deals with what children say rather than what they experience. The reasons children offer to justify their affective response to works of art are not necessarily the cause of such responses. For example, a child can experience with pleasure the harmony and balance of a painting without having at his command the linguistic skill to communicate it. Or, a child might say he liked a performance in order to please the teacher and offer a plausible reason, whereas actually he was bored.

The present investigation breaks ground in attempting to compare reactions to two different arts experiences. It would have been more informative if several different arts experiences had been used. A variety of experiences would make it possible to analyze the frequency of use of a given critical category by age and by arts events. For example, a dance performance might elicit more references to technical competence at all ages and fewer to subject matter than the art events used in Murphy's study. It would then be possible to separate out the effect of a particular arts experience from age-related abilities and establish a much clearer picture of the relationship between maturity and aesthetic justification.

REVIEWER

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THE EFFECTS OF ANXIETY TOWARD ART AND SPECIFIC CURRICULAR STRATEGIES UPON AESTHETIC PERCEPTION

David Moore Hysell, Ph.D.
The Ohio State University, 1971

ABSTRACT

This study proposed: (1) to determine the effects of differently organized learning materials upon the increase or decrease of anxiety levels, (2) to determine differences in student performance in aesthetic perception resulting from the effects of different treatments upon both high and low anxiety groups, and (3) to determine what relationships exist between anxiety toward art and trait-anxiety, prior knowledge about art, and grade-point average.

The sample consisted of eighty college students majoring in elementary education and enrolled in a required art course. This sample was divided into two intact classroom treatment groups and two randomized treatment groups. Each group was tested on anxiety toward art and then subdivided into high and low anxiety groupings. Two of the treatment groups were experimental and two were control; however, each group in both experimental and control conditions was provided a distinct treatment differing from the other in form of presentation. Subjects in the experimental groups received instruction involving the learning on an advance organizer, or a system of three "points of focus" for perceiving and classifying art concepts while the control groups received either art historical information or studio activities. The experimental materials as well as the art historical control materials were administered through programmed instruction.

Besides anxiety toward art, pre-tests also measured prior knowledge about art, ability to differentiate among aesthetic concepts, and confidence toward making aesthetic discriminations. Current grade-point average was also obtained. Each group that received programmed materials self-recorded anxiety responses during treatment as well as responses to questions in the materials from which error-rate was determined. Post-testing obtained difference scores on anxiety change, aesthetic concept differentiation, confidence toward making aesthetic discriminations, and scores reflecting the number of aesthetic elements each subject could perceive in a work of art.

An analysis of variance between treatment groups and sub-groups on trait-anxiety, prior knowledge about art, and grade-point average indicated need for certain covariance analyses on the dependent variables for certain treatment group and sub-group pairings. Analysis of variance was used for the other treatment group and sub-group pairings.

By and large, no significant results were obtained from error-rate, change in aesthetic concept differentiation, change in confidence toward making aesthetic discriminations, or change in anxiety toward art. However, scores on the number of aesthetic elements perceived showed significantly the superiority of the experimental groups over the control groups. It was also found that anxiety toward art has a low correlation with trait-anxiety but not with prior knowledge about art nor grade-point average. The results revealed that the learning of the "points of focus" organizer clearly aids in the perception of aesthetic elements in a work of art.

Order No. 72-15, 225, 258 pages.

REVIEW

W. Dwaine Greer
SWRL Educational Research and Development

Statement of the problem. The purpose of this investigation, according to the author, was to examine the theory that an individual's anxiety toward art learning can be altered through changing the perception of an individual's cognitive adequacy toward art content. However, the map Hysell provides leads one through such difficulties that the problem which finally emerges looms so large it is hard to believe that any one study could attempt its solution. What we are finally presented with is an effort to convince us that programmed instruction in art education should be successful in changing knowledge about and therefore attitudes toward art learning.

Related research. The choice of a particular research stance, (for example the use of experimental methodology adopted from psychology) is a major decision for any inquiry. A reviewer must then discuss the study accepting the parameters chosen by the experimenter. Thus we assume from Hysell's experimental stance that a careful study of the problem statement, theory, and research chosen for review will provide a context that gives meaning to results, their interpretation, and the conclusions drawn from them.

The work begins with an introductory justification for the study of a new area in art education; stating that there have been few, if any, studies that have investigated the specific effects of anxiety to art learning situations. As readers it seems we should look for the demonstration of the use of a new framework for studying art education. Hysell starts his framework from the premise that the content of art education lies primarily within the affective domain. The conjecture is made following this basic premise, that anxiety is a major variable involved in art learning, and one that can be manipulated and measured. Unfortunately, difficulties with the study begin at this point. To move from the linking of anxiety to art learning to the manipulation of cognitive adequacy (lack of knowledge) to the enhancement of art learning (aesthetic education) is a series of leaps in logic that can be questioned at every decision point. To further obscure our view a new set of variables was introduced with the addition of several variations of programmed instruction as a teaching mode. It seems as though the decision was made, after the major part of the study was complete, to go back and shift the emphasis from the initial question of anxiety to one of programmed instruction.

The actual review of research is divided into three subject areas: (a) anxiety and learning, as a setting for the anxiety variable; (b) studies of stimulus complexity, to introduce the instructional approach; and (c) reports of pilot studies by the experimenter. After a rather cursory overview of research in each of the above areas a high-low anxiety-change model is presented. This model, it seemed, was to be the major landmark in the work as it would serve to explain the results of instruction.

The anxiety-change model is followed by a chapter that discusses the instructional materials used. The author states the approach was developed through analyzing literature in the philosophy of art. Checking the bibliography, however, revealed only two separate sources for this area which leads one to question the validity of the instructional materials.

Perhaps work validating the materials was a part of pilot studies, but without evidence we are left with little support for the author's claims. For example, pilot work is cited to support the assertion that there is little reason to doubt the value of programmed instruction in the teaching of art concepts and skills. With a small leap, concepts and skills become aesthetic content. And the choice of programmed instruction is justified as a research tool with: "This method seems to provide optimal control over the research variables as well as providing a realistic setting for learning."

As we move into the examples of the programmed instruction provided in the study and the characterization of their use in the treatment, the direction of the study becomes difficult to follow. Distinctions between the various treatments are not clear, and the focus of this chapter is a comparison of programmed instruction with general art teaching rather than how instruction changes anxiety. Ultimately the major difference in treatments seems to be a preparation for posttest tasks versus giving general art content information. There appears to be little connection to the initial anxiety-change model.

Methodology. With the four methods of instruction differentiated in the researcher's terms, we move to the statement of hypotheses and their elaboration as a design. At this point, labelled, General Procedure, we come to the division of the study noted earlier. Here two quite separate and only marginally related foci emerge: (a) the anxiety-change model, and (b) the testing of the various treatments for their effect on skill in aesthetic perception. Three complex sets of hypothesis statements are used that depart rather widely from the anxiety-change model that was assumed to be the basis of the study. Rather than statements about treatment results measured in terms of anxiety-change, there emerges a second study for which little groundwork had been laid. One can only wonder if some of the study's difficulties arose from an after-the-fact change in focus to the emphasis on the effects of programmed instruction on aesthetic perception.

As can be seen from the abstract, a pretest, posttest design of four treatment groups with multiple anxiety measures during treatment was used. All subjects received equal length, two hour treatment sessions. The reader is referred to the abstract for a more detailed explication of the design and procedures.

At this point questions need to be raised about the length of treatment, the appropriateness of the convenience sample, and the sensitivity of the measures used and adapted. For example, tests used included the Eisner Art Information Inventory as a pretest; the State-Trait Anxiety inventory which was shortened; the Aesthetic Concept Differentiation Measure; and an Aesthetic Perception Index constructed especially for the study. This choice introduces a series of problems in terms of reliability and validity from untried instruments to the subjective sampling of items.

Despite the increasing complexity of the design, the reviewer ploughed on. As a result of four treatment groups by seven dependent variables by seventeen measurements, one is faced with a mind boggling number of tables. With the huge numbers of measures added to the problems previously identified the journey through the study came to a grinding halt. The decision was to consider results and their discussion with caution. The experimenter himself, as he notes the regression introduced by dividing groups on high and low anxiety scores, suggests that significant results regarding changes in anxiety would have to be carefully interpreted.

Results and discussion. The number of analyses performed does make understanding the reporting of results and conclusions difficult. The chapter is divided into four sections of findings: (a) tests of control variables; (b) anxiety-changes; (c) aesthetic perception; and (d) between groups comparisons of aesthetic perception skills changes. They will be discussed in the above order.

Because of unplanned difference between certain treatment groups and sub-groups, analysis of covariance would be required to control for the differences. This procedure was thus used for the major comparisons. Changes in anxiety hypothesized were not significant and with statistical regression unaccounted for we must conclude that anxiety measurement did not offer as powerful a tool for measuring effects of teaching as had been thought.

Comparisons related to skills in aesthetic perception did show significant differences between groups. However, from the discussion of these effects it appears that much of the interpretation relied on the Aesthetic Perception Index. Because this instrument was prepared specifically for the study and reported differences did not hold when combined with other measures used we can have little confidence in conclusions based on these results.

While the conclusions of the study are in general presented with proper qualification they can be accepted with little confidence. The statistical regression problem noted in the methods section is not mentioned anywhere in qualifying the conclusions. The failure to find differences among treatment groups using the anxiety model seems to have been taken as a failure of the study. It is unfortunate that the full discussion of this new approach was not the final focus of the study. Instead of pointing the way for development of more sensitive instruments, modifications of methodology, and refinement or revision of the initial theoretical premises, implications are drawn about programmed instruction. Claims made arising from this study within the initial study are most disturbing. Difficulties with both measures and their results are ignored as the questionable claims are made that the programmed-materials approach used in the study seems to have the potential of opening perception, increasing understanding, and retaining conceptual knowledge about art.

Commentary. Reviewing a work like the one just described raised questions for me that are larger than my reactions to this particular work. I was struck by the myriad of difficulties facing anyone who attempts research in the field. I wondered how to make suggestions that would start toward their solution rather than simply pointing them out as stumbling blocks. The problems and the directions for their solution seemed to fall in three areas: (a) questions of theory, (b) methods for research, and (c) difficulties of direct application of findings to practice. The lack of precision in each area is present in the Hysell study but I believe his work is representative of much art education dissertation work.

Because various aesthetic stances have not been embodied in clearly differentiated art education theories, much work remains to be done before terms like aesthetic content have much meaning. While developing theory is clearly a different task from that of research, recognition of the value of establishing parameters in terms of the limits of a particular theory and sticking to them will help to prevent the growth of a research problem into something unmanageable.

In terms of methods adopted or adapted from a particular social science, this study, like others of its kind, seems merely a quick foray into an unfamiliar territory. If a piece of research is clearly a study in the psychology of art learning then standards applicable to psychological studies apply. Problems that arise in art education research come about because it is assumed that such methods of study will also serve to study the teaching of art. Only as we are able to distinguish between psychological studies of art learning and educational studies of the effects of art teaching will we be able to avoid inappropriate use of measurement instruments and interpretation of their results that plague studies in art education using adapted psychological method.

The last area of concern, that of application, is crucial for Hysell's work. Certainly we will look for research to affect practice in the field. What is to be avoided are claims that are made relating to secondary questions in a study. Somehow we have to be able to convince those who attempt research that a finding of no statistical difference does not necessarily mean that a study is a failure.

Finally let me sum up my reactions to this study with an image my reading left me. Too often it represents the plight of doctoral students in art education. There stands a young Atlas who had earlier seen himself solving the ills of art education now desperately trying to hold up the whole world of art education research while mired up to his shoulders in methodological difficulty and philosophical uncertainty.

REVIEWER

W. DWAINE GREER. *Address:* SWRL Educational Research and Development, 4665 Lampson Avenue, Los Alamitos, California 90720

A COMPARISON OF THREE METHODOLOGIES AS AFFECTORS OF AESTHETIC SENSITIVITY AND JUDGEMENT: DISCOVERY OF CONCEPT AND PRINCIPLE, ART HISTORY, AND STUDIO ACTIVITY

Robert Richard Anderson, Ph.D.
University of Minnesota, 1974

ABSTRACT

This study compared three major art teaching methodologies: art studio involvement, art history study, and concept and principle formulation, with respect to their relative merits as affectors of the aesthetic sensitivity and art judgement of secondary school art students.

Intact mixed-grade level, (ten, eleven, and twelve) introductory art classes from two suburban schools in the Minneapolis-St. Paul area were randomly assigned as four experimental groups of comparable size (thirty-four to thirty-nine).

Each of the four experimental groups, composed of two intact classes, received discrete treatment. The first group was presented with certain identified concepts and principles which, in part, form an underlying ideational structure which may aid in establishing art awareness and understanding. Students were encouraged to use their experiences to test the ideas presented. Slides and motion pictures were the major communication media. No intensive focus was given to production of art objects

The second group engaged in the study of American art history. A chronologically sequenced, illustrated survey of American art was presented. Student participation consisted of discussion, writing papers, and taking tests.

In the third and fourth groups, the primary focus was upon studio art experiences. For the third group, instruction was loosely structured, and students were encouraged to find divergent ideational solutions to given art object production procedures. Experiences of the fourth group were highly structured. Students were guided to the faithful delineation of the human form through the use of restricted art media.

A pre-test battery was administered in April, 1971 to all groups. This battery consisted of two measures of value judgement, the "Child Test of Aesthetic Sensitivity," and the "Graves Design Judgement Test." The "Eisner Art Attitude Inventory" was used to measure psychological report; and an author designed test, rated by three expert judges, was utilized to measure the aesthetic quality of two, student-delineated, art products. This battery was again administered five weeks later, following the experimental treatments.

Eight months after treatment, a post-treatment attitudinal survey, designed by the author, was given to determine latent attitudinal strength regarding the respective art treatments. This measure elicited both quantifiable student responses to prepared statements about their aesthetic experiences, and personal commentary by students.

A t-test of the significance of difference between the means of pre and post test scores for each of the experimental groups, on each of the criterion measures of aesthetic sensitivity or art judgement, produced no results significant at the five percent level or better. The loosely structured studio art experience group was significantly different, at the one percent level, in post-treatment attitude survey mean score when compared to either the highly structured studio art group, or the discovery of art concept and principle group. Although neither of the experimental groups engaged in studio art activities were found to significantly alter their pre to post test drawing performance, the highly structured group was found significantly higher in attitude toward their experience after an eight month period.

The aesthetic sensitivity and art judgement of these high school art students was not significantly modified by these modes of instruction.

Order No. 74-26, 155, 316 pages.

REVIEW

Margaret K. DiBlasio
Purdue University

Statement of the problem. Anderson's intent was to compare three of the major teaching methodologies associated with art, in regard to their relative merits as affectors of aesthetic sensitivity and art judgment. It would have been helpful to this reviewer, and one suspects, to other readers as well, if some troublesome ambiguities of current language usage had been resolved at the start by the author's stipulation. Without such definition of terms the critical reader is distracted by pursuit of prior questions that could be crucial to the interpretation of the study:

1. Are methodology and strategy used as equivalent terms, or does the former refer to governing principles and the latter to concrete practices?
2. The author moves from three major teaching methodologies which are conceptually distinct, to four experimental groups, i.e., (a) discovery of concept and principle, (b) art history, (c) loosely-structured studio art experience. What purpose is served in distinguishing (c) from (d) on the basis of managerial structure, since no conceptual differences of art methodology are involved? This question is of particular importance, since the only two points of significant difference later claimed in the study hinge upon this factor of managerial structure, rather than upon substantive differences among methodologies.
3. How is the author's concept of the aesthetic sensitivity to be affected by these methodologies, and what more might he have to offer us in the way of theoretical foundations?

In the introduction a strong case was made for the need to focus on aesthetic sensitivity in the classroom, but no explicit position is taken on the nature of aesthetic sensitivity other than that which one might imply from the author's selection of Child's test of aesthetic sensitivity.

Related research. The review of the literature is well crafted, especially in its conceptual structure. This section of the work may hold the greatest interest for researchers. The breadth of the survey is commendable; its possible usefulness to the reader is indicated simply by listing the sections:

1. Definitions of Aesthetic Experience
2. Dimensions of Aesthetic Experience
3. Empathetic and Cognitive Dimensions of Aesthetic Experience: A Concurrent Duality
4. Situational Uniqueness of Aesthetic Experience
5. The Relevance of a Conceptual Approach to Aesthetic Experience
6. Practices in Art Education as They Relate to Aesthetic Experience
7. Potential Inter-relationships of Pedagogical Practice and Aspects of Aesthetic Experience

8. Indication of Deficiencies in Aesthetic Education
9. Current Issues in Art Education Methodology
10. Problems in Aesthetic Measurement
12. Identified Factors in Aesthetic Response
13. Selections of Measurement Devices

In view of the scope of his undertaking it is puzzling that some of the leading theorists, e.g., Collingwood, Weitz, Stevenson, have not been featured in their areas of contribution.

Research objectives. The formulation of the research objectives is carefully specified in terms of the instruments employed in each case, e.g., student ability to render aesthetic judgments regarding art objects as presented in the Child Test of Aesthetic Sensitivity. It should be noted that this characteristic poses both advantages and disadvantages for research: It is advantageous to empirical methodology, in that it allows for the formulation of adequately determinate hypotheses, and of little advantage to foundational studies to the extent that the instruments employed fall short of the reality of aesthetic sensitivity.

Methodology. For the most part the researcher gives evidence of careful attention to the manipulation of variables and the observance of controls, to a degree that may be reasonably expected, given the limitation imposed by utilizing an indigenous population in familiar surroundings. The research design can be faulted for not taking into account variables which would represent differences in personal style among the individual teachers assigned to the experimental groups. It seems difficult to justify utilization of the variables of teaching strategy while excluding the personal variables of the teachers. A fundamental consideration in this regard is that while many factors affecting change in students, e.g., media, classroom environment can be conceptualized as operating independently of the human agency of the teacher and can legitimately be measured in this fashion, teaching strategy does not appear to be one of these factors. One courts absurdity if one persists in regarding strategy as somehow existing and operating independently of teachers. Teaching strategies, of course, do not affect anything. It is teachers who affect changes through their use of strategies; furthermore their use is substantially conditioned by the personal configuration of the individual teacher. If the author had been appreciative of the above consideration, he might reasonably be expected to have employed one teacher for all groups, or to have made a random selection of group leaders from the available teacher population.

An especially troublesome feature of the methodology is the author's use of an instrument of his own devising in a manner that places the resulting measurements (and the hypothesis generated in anticipation of these measurements) beyond the controls of the study as initially proposed. The author's Post Treatment Aesthetic Attitude Survey, unlike the other instruments, was not employed to obtain pre and posttest measures. It was administered once, eight months after the respective experimental treatments were concluded, to four of the five groups, excluding the control group.

In subsequent claims and recommendations, the author supports the value of longitudinal assessment of student attitudes toward aesthetic-oriented educational experience. While this reviewer has no quarrel with this advocacy of longitudinal assessment, one needs to keep in mind that longitudinal studies have developed characteristic experimental designs of their own featuring important restraints, many of which have not been observed in the study under review. In consequence of the above considerations, null hypothesis VII, which is constructed upon the posttreatment survey in question, must be regarded as extraneous to the study, and conclusions drawn from this hypothesis (the only one of eight null hypotheses to be rejected) are similarly extraneous, i.e., these conclusions may well be supported by some other studies, but not by this particular study.

Results and discussion. Serious questions must be raised concerning the validity of the entire set of conclusions. As noted earlier, seven of the eight null hypotheses tested are accepted. The first conclusion, that exposure to differentiated art teaching methodologies does not result in immediate and significant modification of the aesthetic sensitivity and judgment of high school students is a conclusion claimed to be drawn from the seven accepted null hypotheses. The proposition quoted above may or may not be a true statement; the proposition, however, does not logically flow from the collected null hypotheses; it is not a conclusion supported by this particular study. There are indications of a fundamental misinterpretation of statistical inference and the function of the null hypothesis. While substantiated rejections of null hypotheses lend themselves to the framing of conclusions, accepted null hypotheses do not prove or conclude anything beyond the methodological posture of caution and systematic doubt which the careful empirical researcher strives to maintain. The researcher with an array of accepted null hypotheses is entitled to say only what he was entitled to say before undertaking the study: that there are certain things he must not yet assume without evidence; and perhaps there are still more relevant assumptions yet to be formulated, held in doubt and tested.

A study may produce no evidence of significant differences among experimental groups either: (a) because there are no significant differences; or (b) because there are differences which the study (possibly deficient in its conceptualizations, experimental design, methodological rigor, supervision, duration, or other circumstances) was not capable of detecting. In situations of this sort the researcher shows good professional judgment by avoiding apodictic statements in favor of honest expressions of no evidence yet that reflect the current epistemological status of his inquiry. To make specific recommendation in the present case, the sort of conclusion that would more appropriately be drawn for this study might employ the following format: There is little evidence that exposure to differentiated art teaching methodologies results in immediate and significant modification of the aesthetic sensitivity and judgment of high school students.

Reasons have been given in the previous section for exclusion from the purview of the study of null hypothesis VII; there is no difference between the means of groups A through D inclusive, with respect to student psychological report of attitude in response to the posttreatment aesthetic attitude survey. The study's remaining three conclusions, each an inference drawn from hypothesis VII, must be denied the status of conclusions, although the reader may still benefit from their stimulative value as personal inferences of the author.

Commentary. The reviewer is grateful to the author for his willingness to forego undertaking yet another easy empirical study, guaranteed against both failure and usefulness, in order to enter bravely into the morass of a complex multivariable study. One may hope for further research along the path that he has opened. Since it is not universal practice that any one of the teaching strategies under investigation be employed exclusively by the individual teacher, it may be productive for some future study to compare the relative effectiveness of several teaching situations which employ a blend of all three strategies, in proportions varying with each group. Such a study would have the advantage of reflecting more faithfully the sort of strategic choices often made in the contemporary arts classroom.

Each new reading of empirical studies in the field of aesthetic education serves to reinforce two of the reviewer's convictions concerning the development of the discipline through empirical research:

1. There is no substitute for doing all one's conceptual groundwork in a scholarly, reflective and analytic manner before designing a study. Neither is there any subsequent remedy for failure to attend to foundational questions.
2. It is important that researchers in the Arts should not merely use the accouterments of the scientific method, as the technicians of many disciplines are doing. The researcher needs to enter into the scientific method with full comprehension; he needs to appreciate its philosophical roots, and to adopt its epistemological posture in order to realize its full advantages.

REVIEWER

MARGARET KLEMPAY DiBLASIO *Address:* Creative Arts Department, Purdue University, West Lafayette, Indiana 47907.

FIFTH AND EIGHTH GRADE STUDENTS' ORIENTATIONS TOWARD THE ENVIRONMENT AND ENVIRONMENTAL PROBLEMS

Robert Emil Horvat, Ph.D.
The University of Wisconsin, 1974

ABSTRACT

Central to environmental education's philosophic foundation is an interdisciplinary, holistic approach to environmental problem alleviation and decision-making. Here this approach led to a study of responses of fifth and eighth grade students regarding various aspects of their environment. Groups of these responses were defined as ENVIRONMENTAL ORIENTATIONS (EOs) and "estimate" environmental decisions. EOs reflect the interactions of cognitive and affective input involved in environmental decisions.

A battery of three validated and reliable instruments was developed to measure ENVIRONMENTAL ORIENTATIONS: 1. toward the present and future (feelings of optimism or pessimism toward the present world, and what the future might hold); 2. toward specific environmental problems, focusing on preferred solutions to specific problems, and whether an individual feels capable of helping solve them.

Semantic differential and Likert agree-disagree formats were used in constructing the three instruments. Through a series of pilot tests, including structured interviews (637 fourth through eighth graders in 12 schools in 7 Wisconsin communities), responses were obtained from urban, suburban and rural students, as well as Blacks and American Indians. Procedures for Inventory development and revision included content analysis, quantitative estimates of scalability, and r biserial correlations with total test score. Reliability estimates included Hoyt internal consistency, and stability employing test-retest correlation coefficients. Content validity and scoring on the basis of environmental responsibility were determined through panel ratings.

The final Inventory was field tested on 665 students in 4 communities. Factor analysis identified the following ENVIRONMENTAL ORIENTATIONS:

the world of today
the world of tomorrow
use/abuse of nature
overpopulation and population control (2)
general environmental concern
eco-responsible behavior
personal concern
eco-insensitivity
environmental protection
technology
action towards nature

ENVIRONMENTAL ORIENTATIONS identified were both internally consistent (Hoyt .62-.97) and stable 4-6 days, test-retest .61-.85). Eighth grade children had more internally consistent and stable EOs than fifth graders.

Two groups of inner city Black fifth and eighth graders reacted differently to many items than other groups. Blacks generally seemed less concerned with overpopulation and recycling, for example, and felt little personal responsibility for causing pollution.

Analysis of variance and Scheffé *post hoc* comparisons helped identify differences in these ENVIRONMENTAL ORIENTATIONS among students grouped by Grade (5,8), Community (urban, suburban, rural), sex, IQ (high, medium, low) and socioeconomic status of family (high, medium, low). Results of analyses indicate:

Fifth graders are more optimistic than eighth graders toward the future, but are also less environmentally responsible. The fifth grader tends to see specific environmental problems in the context of how they affect him and his family. Actions he suggests are often directed at solving the problem for the family, rather than solving the larger problem. He's not afraid to take a stand for or against a technique causing problems, but shuns middle ground compromises to such problems. One prime concern is saving animal's homes, and appreciating the esthetic values in nature. Eighth graders generally take the opposite approach to all of this.

Rural children are more optimistic towards the present world than urban or suburban children. All children, however, are highly in favor of technological solutions to environmental problems.

High IQ children's responses showed a greater concern and awareness towards environmental problems than low IQ children. In fact, IQ and Grade were the two most frequent significant effects. All variables were significant on some EOs, however.

Regarding overpopulation and population control, older children are more environmentally responsible. However, group means on these two EOs were lower (less environmentally responsible) than any other EO.

Children agreed on the most serious environmental problem - air pollution. Overpopulation was not considered either most or least important. High SES children were more concerned with wilderness preservation and population control, contrasting with low SES children's concern with noise and water pollution.

Only about half of the children felt they could help solve any of the environmental problems included. About 30% felt there were no environmental problems in their local communities.

Order No. 74-10, 248, 414 pages.

REVIEW

Dennis W. White
University of Houston

This dissertation suffers from the decision of Robert Horvat to deviate considerably from accepted research models (Isaac & Michael, 1972) in both format and style of presentation. In order to adequately justify such exploration in the method of presenting his research efforts, Horvat's principle rationale should have rested on the development of an expressive mechanism that improved the manuscript's ability to inform. While movement away from stylistic traditions is permitted, even encouraged so as to prevent investigative atrophy, it may only be justified according to Helmstadler, "...when the result is more efficiently accomplishing the sole function of informing" (p. 395). The effort of the author to present a thesis easier to read, in fact generated the reverse effect by forcing the reader to ascertain the logic of his research methodology only after considerable dedication and personal perseverance. Earlier reviews by Brouch (1975) and Rouse (1974) have previously noted the likely undesirable results of pursuing exploratory and unproven models of research presentation by the neophyte investigator.

Statement of the problem. Chapter one contained no clear statement of the problem. Under the sub-title heading *The Research Problem* (pp. 11-12) a laconic description of research purpose was provided; however, a problem is considered to exist when the conditions of a dilemna, quandary or an opposing point of view is apparent, a point distinctly delineated by Clark and Guba (1967). The reader is forced to look elsewhere for a suitable problem statement. In point of fact an acceptable statement of the problem could not be located by this reviewer within the contact of this thesis.

For clarity of research reporting, the proposed research hypotheses located in chapter four should have been included in chapter one. As formulated the hypotheses failed to conform to the null form normally required of statistically tested hypotheses (Van Dalen, 1966). Nowhere within the confines of this dissertation was there a carefully articulated statement, concise or voluble, which could be satisfactorily interpreted or construed as a research hypothesis. The author suggested that the research endeavor was intended to gain "an understanding of elementary and middle school children's Environmental Orientations (EOS) and their variations with several independent variables" (pp. 11-12). The fact that the reader is encumbered to peruse through one hundred and five pages to discover that the study was in reality an assessment of children's environmental orientations (EOS) appeared excessively unwarranted to this reviewer. While a clear definition of terminology was provided with respect to the three distinctions of the term Environmental Orientations, and the independent variables identified, preciseness of communication would have been measurably enhanced by location of each classification under appropriate headings or sub-headings. In this reviewer's opinion Horvat should have placed greater emphasis on formulation of a convincing problem, the relationship of and importance of the problem to education, and creation of a compelling need for the study.

Related research. Chapter two (pp. 13-30) was divided into six sections: (a) Current Status and Needs for Environmental Education; (b) National Affective Surveys; (c) Community-based Affective Research; (d) School-based Affective and Cognitive Studies; (e) Psychological Studies; and (f) Other Studies. The review of literature predominately focused on providing justification for the five variables used in the context of this study. Each variable was properly defended and effectively authenticated as to the reason for its inclusion in the investigation. A logical and parsimonious theoretical basis was not effectively created to explain why ascertaining environmental orientations of children was worthy of extended research effort. Lanier (1974) and Wilson (1971) have noted that the lack of a theoretical foundation from which investigative explorations are undertaken is a continuing problem and one that researchers need to deal with more attentively - this thesis is an example of the profession's need for attention to that concern.

In addition, the contributions of McFee (1971), Small (1973), Smith (1969), and Taylor and Trujillo (1973) would have provided a firmer foundation with respect to effects of environmental conditions on behavior, impact of environmental symbols of inner-city and suburban school populations, and psychological response to varied milieus. Omission of these studies substantially diminished the depth of credibility one could afford the author's efforts to pursue relevant literature prior to engaging in his study.

Normally the third chapter is reserved for the design of the study and contains the overall logic of pursuing the problem, the variables involved, identification of subjects used in the study, the type of instrumentation incorporated, and evidence indicating that such research tools were valid, reliable, objective, and dependable. For the purposes of the present investigation chapter three (pp. 31-104) focused solely on the developmental procedures associated with instrument selection. The author presented an excellent description of the specific manner in which the instruments used were chosen, including a very competent and judicious review of internal consistency and estimate of stability concerns as well as those validity factors identified with each instrument. The authentication and rationale for each instrument as a germane and salient segment for this study was undoubtedly the most impressive aspect of this effort and should be of considerable value to future researchers confronted with developing specialized instruments for specific investigative purposes.

Methodology. Chapter four presented classification of the independent variables, sample information, field test procedures, statistical measures, and matrix design of the study. The author states that no random choice of Wisconsin communities was claimed for this study (p. 106); however, it is evident that at least a limited randomization of population selection was conducted and that this sampling technique was combined with selection procedures which used intact classes as well as individuals chosen by an unspecified nonrandom manner (pp. 107-108). There was no indication of the randomization method used nor a justification for conducting sample selection based on three different criteria.

The author appeared to be very diligent in his attempts to provide the reader with substantiative explanations with respect to why specific subset population tabulations on different variable measurements deviated from the total population sample size. Included within these explanations is an exceptional indepth review for the exclusion of a specific "Black Anomaly" consisting of 19 students (pp. 380-382). However, one sample size discrepancy was noted. On the independent variables of sex differentation and grade level placement a total of 26 students is not accounted for when subset figures are compared to population total. There appeared to be no adequate explanation associated with the numerical variation noted. Considering the high degree of effort exhibited by the researcher with reference to providing substantive rationales for particular sample omissions, nonattention to this sample discrepancy should most likely be considered an oversight rather than an intentional action.

Another point of concern is that no definition of what was meant by the factors rural, suburban, and urban communities was provided. Failure to precisely describe the limiting homogeneous parameters associated with each of these factors, and how the selected communities meet these unspecified requirements must consequently weaken in considerable measure any interpretation given to the relationships established between environmental orientations and the independent variables considered as a result of statistical descriptions.

The investigator stated that the administration of the tests was by his person (p. 112); however, earlier in the study Horvat indicated that a testing team was utilized (p. 108), and throughout the dissertation the plural term "we" is used suggesting that more than one investigator was associated with this research. If in fact more than one researcher maintained an active role in the investigation this point should have been clarified and the activity of each member carefully described (Helmstadter, 1970).

Results and discussion. Significant correlations determined between Environmental Orientations and the independent variables of sex, grade, and socioeconomic status appear to be justified in light of the statistical treatments used. The interpretations drawn from this data also seem to be equally valid.

With respect to the acceptance of the author's interpretation of the significant correlations found to exist between IQ or community factors and children's environmental orientations a word of caution is deemed advisable. The lack of a precise classification determining what exactly constituted rural, suburban, and urban community distinctions must act to temper acceptance of the findings as drawn from the data without equivocation. Reliance on IQ measurements dependent upon instruments standardized on middle-class, Anglo-Saxon populations may have disproportionately affected the findings with respect to those children representing a minority ethnic position. Replication or follow up investigations should consider the use of IQ measurement instruments specifically designed to control for cultural bias.

The author did not provide any formal recommendations as to where future study in this area might proceed to most effectively capitalize on his exploratory assessment of the orientations children maintain toward problems associated with environmental conditions.

Reviewer's commentary. Research as a specialized form of human behavior should always be considered as an evolutionary manifestation capable of taking new form as events and technological advancements prescribe that such modifications are both necessary and desirable. Efforts in this direction should be taken by those individuals with proven comprehension of current research methodology who are intimately aware of strengths and weaknesses inherent in the present system. It is doubtful that individuals proceeding with research efforts aimed at fulfilling a doctoral program are in a position to effect meaningful transformations of established research models. The deficiencies contained in this study appear to stem predominately from the decision of Horvat's doctoral committee to encourage him to develop his own style and format for research reporting. This reviewer seriously questions the wisdom of that judgment.

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REVIEWER

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AN INVESTIGATION OF AESTHETIC JUDGMENT AS A BASIS FOR CURRICULAR CHANGE

Mary Ruth Stevens Harrison, Ed.D.
University of Southern Mississippi, 1973

ABSTRACT

The problem. This study was conducted to determine if differences in aesthetic judgment exist among students in the public middle school system of Escambia County, Florida, who have been enrolled in two widely divergent approaches to art education at the sixth grade level. In addition, relationships between aesthetic judgment and economic environment, parental educational level, race, sex, scholastic aptitude, and academic achievement were investigated.

Methodology. The population of the study was 366 middle school students enrolled in two middle schools of Escambia County, Florida. The schools were selected for similarity of size, economic background of pupils, racial balance, and academic aptitude and achievement, and for art programs of two distinct types. One art program was taught by the classroom teacher, who was a member of a two-teacher team, and had responsibility for two additional academic subjects. The second art program was taught by an art specialist, a member of a five-teacher team, whose sole responsibility was for art instruction.

Twenty-one hypotheses were posited and three standardized tests were used to investigate differences in aesthetic judgment. Areas examined were: (1) the aesthetic judgment of two groups of students enrolled in contrasting art curriculums, (2) the aesthetic judgment of the total group in relation to non-academic factors of economic environment, educational level of parents, race, and sex, and (3) the aesthetic judgment of the total group in relation to academic factors of language, non-language, and scholastic aptitudes, and reading, arithmetic, language, and academic achievements.

Results and conclusions. No significant differences between the students enrolled in the classroom teacher program and the art specialist program were found when scores were compared using a t test. A further subgrouping by variables of sex and economic status revealed no differences between the two groups.

Total group aesthetic judgment scores and non-academic variables were examined. A t test revealed that economic status and parental educational differences were significant at the .01 level. Combined scores of Negro and Caucasian students were significant at the .01 level. Subgrouped scores showed a difference between Negro and Caucasian females significant at the .01 level. There was no significant difference in aesthetic judgment between the males of both races. No significant difference in aesthetic judgment was found between the scores of males and females

Total group aesthetic judgment scores were examined to determine the relationship between aesthetic judgment and the areas of language aptitude, non-language aptitude, academic aptitude, reading achievement, arithmetic achievement, language achievement, and academic achievement.

Non-academic and academic compositions of the student groups are presented in the text of the study, as well as a summary table of hypotheses.

Order No. 73-32, 001, 187 pages.

REVIEW

Jim Wright
Glassboro State College

Statement of the problem. It is at this point that the researcher seems to get into trouble. The problem is not clearly articulated at any one point but spread around in a rather rambling introductory chapter. In essence, the problem is stated under purpose of study: "...to determine if two curricular approaches to art education were associated with differences in aesthetic judgment of the students...in two divergent art programs" (p. 7). The only distinction made in curricular differences, however, seemed to be whether the children were taught by professional art educators or classroom teachers. Further subfactors were also analyzed along rather traditional lines: the learners' socio-economic backgrounds, academic aptitudes and achievement. It further seems evident that a hidden agenda for the inquiry was to determine a difference in learners on the basis of race - but the issue was never directly confronted.

Related research. The somewhat befuddled approach to identifying the problem sets the tone for the rest of this inquiry. The author's review of related literature and research fares no better. She makes the overextended statement that "Empirical studies concerning the development of aesthetic judgment of students at the middle school level...were lacking" (p. 6). When one considers this research was completed in 1973, and presumably done within a 1966-73 time frame, the extremely penurious approach to the literature is difficult to accept. This time frame was marked with considerable activity in and around these concerns. It may be noted that there was no less than 50 to 65 articles and studies done during this period of time that could have been observed (Wright, 1975). From 1966 to 1970 there were 51 articles and studies that generally relate to this problem in *The Art Education Journal* and *Studies in Art Education* (Wright, 1975). There were specifically nine related research projects during this period in *Studies* alone. The incredible thing is that Harrison did not once refer to either journal in her entire survey of literature.

It is further noted that the rather skimpy review is from very dated material, frequently relies on secondary sources, and represents a poor choice of the few art education books used. There seemed to be no attempt to thoroughly examine related research in art education or allied fields of interest.

Related objectives. The dissertation lists 21 separate hypotheses which Harrison groups into the three major areas outlined in the abstract (instruction, learner idiosyncracy by socio-economic factors, and academic characteristics). At a glance the hypotheses appear clear enough, but careful examination and comparison to implementation reveal a muddle of terms and application. Objectives are not logically stated or followed because they take on permutations as the thesis progresses.

Methodology. This reviewer has reservations about the design, procedures and application of the measures used. Graduate students typically cast about for authenticated tests they can then apply (like a coat of paint) to their problem. The idea is that if the test has been reviewed and validated in a published source, then it must be good. Searching questions are frequently not asked about whether the instrument is appropriate to the population, and importantly, whether it really has much to do with art. The only instrument Harrison used to test her major hypotheses was the Meier Art Judgment Test. She accepts the test as valid basing her opinion on reviews that were themselves at least ten to fifteen years old and can be generally described as cautiously acceptable (pp. 33-35). There was no attempt to use any other measure for aesthetic judgment or to generate and test measures for this project. Art education literature was not adequately reviewed to search out possible meaningful measures.

In the review of the literature, Harrison notes that several researchers caution against drawing general conclusions from similar tests, but since the Meier test seemed the least objectionable the decision was made to use it. On examination the test used in this study was originally developed in 1922 and a revised 1940 version was administered. Of the 100 art reproductions the children viewed, not one represents contemporary art, and only two or three approach modern art. Most are genre pictures of Nineteenth and early Twentieth centure paintings with no sculpture or crafts represented. Students are asked to choose the best work between the original picture and an altered version. While the test probably has some use, many items seem silly and irrelevant; could they have meaning to seventh graders? Harrison spends considerable space documenting and justifying this test as well she might; it is the basis for the entire study. This test, in my opinion, is inadequate, and should not be used as the base for an entire dissertation, or to generate meaningful data about the aesthetic responses of contemporary children.

Other items of interest are that the Meier test normative data was not computed for seventh graders (the test population) and is entirely dependent on the children's ability to understand its written directions. (Many of the children tested are described as deprived, thus a question is raised about their understanding of test directions.) One must question the reliability and appropriateness of this measure with this population. Harrison further attempts to measure the effects of the two sixth grade curricula on the students when they are in the seventh grade. There is no attempt to account for maturation or the variation in the sample populations themselves.

Results and discussion. This is the most articulate section of the study. However, if the original measures are not meaningful, the population variances not accounted for, the methods questionable, and various variables not accounted for, any conclusions drawn are suspect. The entire study seems to lose focus from time to time and the results drawn are difficult to relate to what has gone before. The major conclusion (no difference between the two instructional groups) is probably the only conclusion that can be drawn considering the substantial flaws of this research.

Commentary. The majority of this reviewer's discussion exists in the preceding analysis. Unfortunately this project does not meet the criteria for rigorous research. Its failure to adequately survey the field and its singular dependence on one dated measure makes it less than distinguished. However, like past reviewers for this journal, I must find major fault with Harrison's committee. Doctoral dissertations are generally (given basic student capabilities) as good as the committee that oversees them and in this case they clearly failed the candidate. With better direction and more focus, Harrison's efforts would have been more fruitful.

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REVIEWER

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SEQUENCED AND NON-SEQUENCED CONCEPT LEARNING OF SYMMETRY BY HIGH AND LOW VISUALIZERS: AN EXPERIMENTAL STUDY WITH FOURTH GRADE CHILDREN IN ART EDUCATION BASED ON A SYSTEMS MODEL

Bobby Louise Rowe, Ph.D.
The Florida State University, 1974

ABSTRACT

The purpose of the study was to investigate the interactions between different treatments of visual concept learning and a visualizing ability trait. It was hypothesized that (a) visualizing ability would have no significant effect on the learning of a visual concept and (b) that sequencing concepts in one learning track and omitting these prerequisite learnings in a second track would cause no significant differences in the scores on a visual concept mastery test or on an art transfer test administered to the high and low visualizing subjects. The instructional materials and the tests for the study were developed on the Briggs Model of Instructional design and the task analysis for the sequenced concept learning track was based on Gagne's hierarchy of learning levels.

Tests of figure transformation and shape manipulation were administered to 600 fourth grade students in a school system in central Florida. Eighty-two students whose scores fell in the upper quartile of scores and eighty-two students whose scores fell in the lower quartile of scores were designated high and low visualizers respectively. High visualizers were randomly placed into the three treatment groups as were the low visualizers. The instructional medium developed for the instructional tracks consisted of two filmstrips, each teaching the visual concept, "symmetry," in a different methodology.

The concept mastery test was a demonstration test of arrangements of shapes symmetrically on a matrix and the art transfer test consisted of identifying in art exemplars.

A 2 x 3 factorial analysis of variance was used as a statistical test with two levels of visualizers high and low, and three treatment levels sequenced, non-sequenced, and control.

The outcome revealed a significant difference between the high and low visualizers in mastering an abstract visual concept, means being greater for the high visualizers. Each group receiving overt instruction in visual concept learning obtained means of significant difference over that of the Contro Group.

Data from the study confirmed the critical importance of sequenced systems of instructional design for both high and low visualizers and revealed a larger transfer value obtained from the high visualizing sequenced treatment group. Transfer was minimal for the low visualizers in comparison with that of the high groups.

Order No. 74-18, 060, 301 pages.

REVIEW

Larry A. Kantner
University of Missouri

Statement of the problem. This study was concerned with the effects of sequenced and non-sequenced learning treatments on subjects of different visualizing abilities and the possible transfer value of the concept learned.

The level of assimilation to the factors of the visual study (high and low) was determined by the Flags test and the Minnesota Paper Form Board test; and three treatment levels, (a) sequenced-concept instruction, (b) trial-and-error concept learning without the aid of the analyzed concepts, and (c) control group which received no concept instruction.

The questions asked by the researcher were: (a) Will low visualizers learn an abstract concept equally as well as high visualizers if the concept is in the visual mode and the means of measurement are also in that mode? (b) Will the high or low visualizing trait or the sequenced or non-sequenced instructional treatment affect the generalization of the concept for use in art? (c) Will high and low visualizers be able to abstract and apply a concept generalization in the visual learning mode equally well?

The researcher gave a well-reasoned defense for investigating her concerns. With the basic premise that art learning is dependent on intellectual functioning she proceeded to justify the study with a reference to earlier work investigated under the term imagery by studies of Calton, James, and Fechner. She then considered the research of Short who used visual stimuli to elicit mental tasks. The lineage of types of imagery was traced from Fechner to Tichener to Boring to Holt.

Using Gagne as her primary source, she considered and used a sequential learning process as a structure with defined instructional methodologies and expected behavioral outcomes. One aspect that was of major importance to the study was that of Gagne's positions regarding vertical learning transfer. This provided the basis for considering a possible system of visual art concepts structured into a sequenced learning framework. Referring to the writing of Wilson, Berlyne, and Harris, she substantiated the interest voiced for the development of a systematic structured curriculum firmly based on learning theory, providing an objective measure for visual learning.

Review of literature. The review of literature covered two major areas: visualization as an ability trait and sequencing learning structures. The researcher reviewed the influence of imagery on the thought process during the act of learning. Opposing views of Pear to Aveling and Bartlett are discussed with Pear stating the mentality of most ordinary persons is seriously affected by their predominant imagery and Aveling and Bartlett arguing the image being the product of thought.

To this controversy, ideas such as J. B. Watson's thinking is largely a verbal process were added. From this historical reference on imagery the writer discussed the more recent work of A. Paivio and Dilley on paired associate learning mechanisms, the results being that the more concrete the stimulus the more faciliatory the stimulus effect as a stimulus means. This brings up the question of visual learning in the school curriculum. The researcher recognized that this question has not been resolved, stating the attitudes of Eisner, Schwartz and Douglas and the research findings of Cromer, Stewart and Kuhlman. This leads to the basic question posed by the researcher: "Are learners who are high visualizers less able to use abstract thinking than low visualizers if the learning mode and transfer tasks are both based in visual-intellectual processes rather than verbal ones?"

In the section, Investigations into Sequencing Learning Structures, the writer questions that visual concepts need to be sequenced in a hierarchial structure in order to be learned. Much of the writer's rationale is based on Gagne's hierarchy of vertical and lateral transfer of learning. The researcher recognizes the lack of empirical research on hierarchies of concept sequences in art content of a visual nature. However she differentiated this from various instructional methodologies in that behavior in visual discrimination and concept learning in art can be changed. In addition, the researcher reviewed the study of Hamilton whose findings are in opposition to this study.

Using the works of Newton, Hicky, White and Briggs the researcher defended and developed her position of the validity "to investigate a sequenced track of visual concept learning interacted with the learner's characteristics of visualization which may offer implications for curriculum structure in art education."

Development of instructional model. In this chapter the researcher described three areas of the study. (1) Theoretical Context: Concept Learning. The researcher has a rather extensive investigation on the topic of the concept of the concept drawing primarily from the work of Kendler and Kendler, Clarizion, Heidbreder, Vinacke, Osgood, Hunt, Bruner, and Restle. In defining concept, the researcher uses T. Kendler's definition "Learning to classify a stimulus situation in terms of property attributes." The researcher explains that her experimental study of symmetry will include an organized sequence of attributes in the form of prerequisite concepts which need mastery, rather than simple observable attributes of a stimulus object.

The researcher considered the concept of symmetry as a conjective concept which also meets the all or none theory of Restle. Models such as Wooley and Tennyson were also used as tools to develop the concept attribute control processes needed in preparing the filmstrips on concept mastery. Based on the work of Gagne on hierarchy of learning, two learning tracks were developed (one sequenced and the other random.)

(2) Instructional Content for the Model: Symmetry in Art. The researcher defines symmetry as a visual one-to-one correspondence of parts in equal size, shape, and spatial placement equal distance from each other on opposite sides of a bisecting line or point. The researcher states that knowledge of symmetry is a necessary basic concept needed in making critical analysis of particular visual arrays as well as in formal arrangements used in personal art production. I am assuming although the researcher suggests that presenting examples of concepts of symmetry to children by the use of art works could be confusing, it is necessary for the children to gain the basic concept. She does admit that the use of simple shapes and limited range of color and geometric pattern precede the transfer of the concepts to works of art. This provided the basis for designing a concept mastery test and a transfer task for art knowledge.

(3) Design of Instruction: Briggs model. The design instructional system is adapted from the Briggs model. According to Briggs, systems models are primarily predesigned and there is a characteristic ordering to the instructional components: (a) specification of instructional objectives, (b) development of tests measuring attainment of those objectives, and (c) selection of media and design of instructional material.

The first component of the Briggs model requires objectives for the concept mastery. Therefore an objective was established for each concept mastery; for teaching symmetrical arrangements of art elements; and for the instructional experiment.

Following Gagne's hierarchial structure the researcher stated three prerequisite concepts: (a) bisection and equidistance, (b) one to one correspondence of parts, and (c) lower levels of discrimination. A task analysis for the sequenced concept learning track was a series of general and specific mastery of objectives.

The subjects were randomly sampled fourth graders from a city school system.

Media analysis (according to the Briggs model) involved: checking the features of visual and verbal stimuli, movement or skill demonstration, review of entering competencies and in the consideration of other perceptual instructional event, stimuli, media options, tentative media choice and final media choice. A filmstrip was chosen as the medium to be used. Again the Briggs model prescribed how the material was to be designed. The researcher, who also served as the instructional designer stated that the task asked of the learner would be concept identification and not a visual discrimination difficulty that would trick the learner. A tape explaining the content was used with the filmstrip.

Two filmstrips were designed as different learning methods. The previously developed instructional objectives were employed and the subject was requested to hold several images in his mind and select as symmetrical the stimulus situation which met a type of symmetry.

The film tracks differed in that one was presented in a predetermined sequence (making use of units of prerequisite concepts). This film presentation was divided into four sections: (a) horizontal symmetry, (b) vertical symmetry, (c) combined horizontal and vertical symmetry, and (d) rotational symmetry.

The other film track gave no analysis of the prerequisite concepts. The content and time were balanced with the sequenced filmstrip; however there were some differences in material presented.

The Briggs model was also used to test the model's objectives. The four levels are: (a) end-of-course objectives (life-long objectives), (b) end-of-unit objectives (formal structure of art elements), (c) specific behavioral objectives, and (d) subordinate competencies of specific objectives. The researcher states that the concept mastery test was designed as a demonstration performance (arrangements of shapes symmetrically on a matrix) while the art transfer test used classification and identification as the response performance (identifying symmetry in art exemplars), both having a criterion performance specified.

An extensive pilot study was conducted on various test and response modes. Six nine-year-old subjects were used to pilot the final test packet.

Methods and procedures for experimental study. Using the Minnesota Paper Form Board Test (MPFB) and the Flags Test (shape manipulation and figure transformation test), 600 sugjects were tested and the total individual scores categorized them as high or low visualizers. Sixty-four subjects were selected from the upper quartile (high visualizers) and 64 subjects were selected from the lower quartile (low visualizers). Equal numbers of subjects from each grouping were randomly placed in the control and experimental groups. This gave a total sample of 164 (28 subjects in each treatment group). Within treatment groups, the tests were administered to small groups of subjects of both high and low visualizers simultaneously. Test scores were obtained for the Concept Mastery and Art Transfer Test from each subject.

Results and discussion. An analysis of variance was computed on scores from the two dependent variables, the Concept Mastery Test and Art Transfer Test. A 2 x 3 factorial design using ability and treatment as factors was used. The ability factor contained two levels of ability, high and low visualization, and the treatment factor contained three levels of instructional treatments: (a) sequenced learning, (b) trial-and-error learning, and (c) a control group treatment.

The F-test statistic was significant at the .01 level in each of the following cases: (a) between high and low visualizers on concept mastery test, (b) between treatments on concept mastery test, (c) between high and low visualizers on art transfer test, (d) between treatments on art transfer test, and (e) between ability and treatment on art transfer test. Thus, all four of the null hypotheses of this thesis were rejected. To further investigate the relations between factors, the Neuman-Keuls test was applied to the means for the treatment groups and yielded significance at the .05 level in each of the following cases: (a) on both concept mastery and art transfer tests: (1) sequential treatment exceeded both trial-and-error and control, and (2) trial-and-error exceeded control; (b) on the art transfer test: (1) the high visualizers with structured treatment exceeded all other groups, (2) the high visualizers with trial-and-error treatment exceeded all groups except the structured treatment high visualizers, (3) the low visualizers with structured treatment exceeded the low visualizer control, and (4) the high visualizers' control exceeded the low visualizers' control. The noted exception to a complete ordering was that among the low visualizers there was no significant difference between the sequential and trial-and-error groups and no significant difference between the trial-and-error and control groups.

As the researcher stated, the purpose of this study was to arrange the conditions for learning a visual concept and to measure both its mastery and its generalization to use in art. From the results of the study the researcher reported that the learning effect of sequential programming in instructional design for both high and low visualizers was beneficial and that there was transfer. She also pointed out the value of identifying prerequisite concepts in teaching concepts and that abstract concepts of an intellectual aspect are tools of visual thinking and possibly need more attention in instruction.

The researcher concludes that the study attempted to bring attention to individual differences in the visualization trait as it influences cognitive functioning in art. It included a focus on concept learning in relation to the visual mode of information processing. It explored the use of systematic instruction for cognitive learning in art in contrast with similar opportunity for intuitive learning to occur, and it tested lateral transfer of visual learning.

Commentary. The Rowe study is a lengthy and extensive one which has been well researched and defined. The researcher's literature section is a thorough search; however, because of its length a summary would have been helpful. The writing style is excellent except for times in the discussion of the prepilot and pilot when it likens to a personal diary or an advertisement for the instrument and instruction. The commentary in the main body of the thesis concerning sex differences and use of students' Stanine scores should have been left to the discussion section and appendix. The researcher did not give a convincing argument for choosing fourth graders. It is the earliest age for which the MPFB is recommended; however, this is hardly an adequate reason. Some further discussion on the topic would have been helpful. The trial-and-error filmstrip was reviewed only once and the statement made on revision was residue of suggestions from the piloting of sequenced filmstrip was applicable in most instances to the design and construction of the trial-and-error filmstrip, although comments about frame arrangement were different. This comment leaves an ambiguous notion about the original construction and the revision. Even though the concept was symmetry, I question the advisability of using black and white reproductions in the test instruments. In the sequenced filmstrip not only were the images sequenced but some of them were also coded, adding another dimension of focusing that may have had a stronger effect than that of the sequencing. Why some examples were different and not merely in a different sequence is not clear.

In terms of curriculum consideration the question of how valuable this kind of experience is to a ten-year-old and how much time one should take from or incorporate in their art experience becomes a philosophical question on which one will not find agreement. It would also be interesting to note the students' reactions to such training regarding their own work and the work of others. As confirmed by the concept mastery test and art transfer test high visualizers did significantly increase their awareness of symmetry; of equal concern is now the question of the low visualizers who as a group did not respond as well to the sequenced or trial-and-error methods.

The areas of concept learning as it relates to the visual mode of information processing at various levels of development and the effective development of a systematic plan of instruction involving art and the art experience for children both need to be investigated. The Rowe study has provided a valuable structure and methodology for visual learning in art.

With the developing interest in the art visuals skills as they relate to reading skills this thesis may also provide some possible clues to better understanding and testing in this area.

A CURRICULUM FOR AN AESTHETIC PROGRAM FOR TEACHER EDUCATION

Susan Maxwell Brainerd, Ph.D.
University of Massachusetts, 1972

ABSTRACT

This dissertation contains a conceptual framework, goals, and implementation strategies which comprise a curriculum for an aesthetic component of teacher education. The curriculum developed is presently being implemented as the core teacher education offering of the Center for the Study of Aesthetics in Education (CSAE) at the School of Education, University of Massachusetts/ Amherst.

Chapter I presents a definition of the major learning processes of Aesthetic Education: *aesthetic experience* and *creative expression*. An aesthetic experience includes at least three basic interdependent components:

1. Aesthetic attitude
2. Creative perception
3. Unity and meaning in experience

Creative expression is a working process in which the components of aesthetic experience are applied to the following activities:

Exploration of materials,
Improvisation with materials,
Evaluation of process,
Extension of process and use of materials.

This working process can be applied to any natural or manmade materials, including movement; visual, tactile, and aural materials; emotions; and situations. This chapter concludes with a discussion of multi-arts improvisation, which is viewed as a major vehicle of Aesthetic Education.

Chapter II focuses on the ways in which Aesthetic Education develops the whole learner through active learning processes. Aesthetic experience and creative expression are seen as activities which involve the psychomotor, perceptual, affective, cognitive, volitional, moral, and cosmic-aesthetic learning potential of the learner to facilitate integrated competency development. It is shown how the processes of Aesthetic Education are mutually reinforcing with the processes active learning described by Piaget, Bruner, and Torrance. This chapter concludes with descriptions of ways Aesthetic Education can be theoretically integrated with and used to support some major areas of present educational innovation; early childhood education, affective education, and the open classroom.

Chapter III details characteristics of the kind of responsive learning environment which is necessary to implement Aesthetic Education. It is shown how, through participating in a responsive learning environment in their pre-service or in-service training, teachers learn to use Aesthetic Education to promote a responsive learning environment in their own classrooms. Goals for an aesthetic component for teacher education are then developed from the preceding conceptualizations:

> A curriculum for an aesthetic program for teacher education must provide learning opportunities which encourage teachers to experience, gain theoretical knowledge of, and learn to facilitate:
>
> The process of Aesthetic Education
>
> Active, creative learning involving the whole person
>
> Responsive learning environments.

Chapter IV contains a description of the course organization and learning strategies presently used in the core offering of CSAE. This offering is organized into flexible groups of modules containing open-workshops, discussion-workshops, related readings, and extension activities. Sample groups of modules, which exemplify implementation of the goals, are outlined in detail. The personnel who facilitate the core offering are trained in multi-arts improvisation through CSAE's graduate programs.

Chapter V provides a discussion of implications for further development of the present core offering and for further research in Aesthetic Education and related fields, such as creativity, affective education, and cultural arts. Continuing development of teaching styles and learning opportunities which foster open communication, unique and extended personal experience, and self-evaluation are viewed as crucial to the future development of Aesthetic Education for teachers.

Order No. 72-18, 016, 193 pages.

REVIEW

H. James Marshall
University of Illinois, Urbana

As the title suggests, the purpose of this thesis was to develop a curriculum for elementary classroom teachers which would prepare them for teaching children through learning experiences that emphasize aesthetic responses and which, concurrently, cultivate expressive behavior. The author attempted to build a rationale for the curriculum through relating concepts of aesthetic education, creativity, expression, sensory perception and theories of learning behavior. These ideas are causally interwoven to reveal that once one has engaged in the proposed curriculum, creative expression is assured. Not only does one develop skills for aesthetic experience and artistic practice in all the arts, but he develops skills in the processes of creative problem solving which greatly enhance his learning in other areas.

By virtue of the fact that this study was undertaken as a curriculum program, it does not follow either the form of an empirical/experimental design nor the logical structure of clear cut philosophical inquiry. Consequently, what the author has elected to do falls somewhere in between the two forms of research - a technique which is undoubtedly one of the most difficult to manage. At this point, the task at hand seems almost too formidable for one to complete as a topic for a doctoral study with a degree of alacrity yet with thoroughness.

The thesis contains five topical chapters with three appendices containing references, resources and program materials. Chapter I introduced the idea of aesthetic education and the components of aesthetic experience named (a) aesthetic attitude, (b) creative perception, and (c) unity and meaning in experience. Aesthetic attitude, as described by Stolnitz, is the disinterested and sympathetic attention to and contemplation of any object of awareness whatever, for its own sake.

The component of creative perception, coined by the author, is extended from statements by Stolnitz, from Dewey's theory of experience, and from ideas of creativity by Gunther, Parnes and Torrance. This component is seen as having four aspects; it is an activity of energetic sensing, responding with imagination and feeling, sustained activity (creative control of one's senses and his responses), and extending the emotional responses. Unity and meaning in experience (also Deweyan) emphasize the interaction of man with his environment and requires his full attention to sensory, emotional, and intellectual responses, particularly as they bring to focus the felt qualities of objects and events in environment, that is, at the level of the immediate educational level. An important outcome of the proposed aesthetic development of creative expression which, essentially, precludes that one has the capacity for genuine aesthetic experiences. The concept of creative expression, adapted from Linderman and Herberholz, is described as a cyclical process, beginning with awareness and concluding (at least momentarily) in a personal statement or product. Ultimately this process is related to the idea of communication (as a form of expression) and to methods of evaluation which may lead the learner to understanding his (creative) processes and products. Thus, a workshop method, called the multi-arts improvisation, devised by the author, included evaluation criteria and techniques as part of the function of creative expression processes.

In Chapter II, learning theory provides a framework for the author's teaching strategy, the multi-arts improvisation. Three learning concepts (exploration of sensory materials, improvisation, and evaluation of the process) are adapted from the act of learning (Bruner) and from creative learning (Torrance). A number of substantiating premises are included in the rationale for this strategy. For example, a prime condition is that learning involves the whole person of the learner (Carl Rogers) and that the whole person must develop through processes of active learning; accordingly, these processes or various kinds of learning suggest the major areas by which the teacher can diagnose or ascertain the learner's competencies. There are seven tremendously broad major areas, including the (a) psychomotor, (b) perceptual, (c) affective, (d) cognitive, (e) volitional, (f) moral, and (g) aesthetic. All of the above areas of learning competencies are adapted from a model program developed by Daniel Jordan for the American National Institute for Social Advancement, but the author cites ample references and studies in her elaboration of what characterizes the whole person and those learning competencies which the teacher must facilitate.

Chapter III of the study presents the initial goals for the aesthetic education program for teachers which are based on the components of aesthetic experience, the teaching strategy, and the learning processes. These goals are supplemented with a matrix of assumptions and learning conditions necessary for a responsive learning environment through which the proper teaching skills are attained.

In Chapter IV the goals were implemented in a core offering for elementary classroom teachers as a part of the teacher education program in the School of Education at the University of Massachusetts. Here, a rather succinct modular schedule of the program content was outlined in which goals were specified for open-workshop and for discussion-workshop modules; two other modular categories were indicated, one which provided preparation assignments for future modules and one entitled "extra modules", which were open experiences that the students could elect on an individual basis, depending on the amount of work and credit they had arranged.

The concluding chapter summarizes the author's estimate of the curriculum program based on its implementation at the University of Massachusetts. Accordingly, the multi-arts improvisation approach, in light of the varied learning outcomes it encompassed, was highly useful in that it lead directly to implications for further study. It was recommended that research should be continued for developing ways to teach children through multi-arts experiences as well as to pursue the idea that the function of art in society is to share feelings and ideas. Such exploration could incorporate study of the arts of ethnic groups and primitive and ancient cultures in order to improve one's understanding of people of different origins and backgrounds.

Based on the study of concepts about learning for the whole person, the author suggested more study should be conducted to reveal how aesthetic education supports cognitive, creative, and affective learning. Further it was suggested that aesthetic education, self-identity, independence, open education techniques, and teacher-pupil communication are all integrally tied together, and that their complex relationship must be explored in order to expose some of the dichotomies teachers have between their educational ideas and their practices.

In evaluating the implemented curriculum, the author found some of the techniques used, such as performance criteria and attitude surveys, were not only burdensome but inherently threatening, distracting, and purposeless paper work. The preferred kind of information would be gained through feedback from student journals, discussions, projects, and observations during the program rather than at the end. Recommended for further study was the greater use of student participation, self-determined goals, and student-teacher interaction procedures.

Reviewer's commentary. At the risk of being tautological, this review contains much of the information and form as that of the dissertation abstract preceding the review. However, this procedure has been used in order to frame a background for assigning the following judgments: (1) The author's intentions are well taken, putting ideas about aesthetic education into a practical working form is an area about which knowledge has been diffuse and unclear, and until recent years, preparing young people for an enduring aesthetic life has been almost ignored. For this reason, concerted efforts should be made toward refining the best means for attaining worthwhile aesthetic activity and artistic involvement. However, in light of the need for such study, it is apparent that more stringent and thorough requirements for research in this area should be maintained. The difficulty with this study is in the ambiguity caused between the nature of aesthetic experience, the act of creation (or expression) and the forms of thought which distinguish these from other kinds of thought where abstract knowledge and practical purposes are attained. Even though the major purpose of this study was to develop and to implement a curriculum program, the rationale or argument for cultivating aesthetic responses is weak. The author's bibliography on philosophy of art and aesthetic education is impressive, but, except for the inclusion of Dewey's idea of the aesthetic experience, there is no thorough overview of the nature of aesthetic behavior. Consequently, the value of aesthetic experience seems to be essentially its means-end relationship to artistic production and manipulation of media. The intrinsic worth of aesthetic phenomena to human life is skirted, and the emphasis is placed on how an aesthetic education approach not only enhances but insures learning outcomes which apply to all other areas of one's educational growth. This assumption is not statistically substantiated in this study and certainly can be questioned from a number of philosophical viewpoints. (2) The possibility of attributing a wide range of learning objectives to an acquired aesthetic attitude, or to an aesthetic education program, sounds highly desirable. But, the number of learning competencies, the development of the whole person, the development of social processes, the teaching techniques, the capacity to create, to express, to attain artistically, and so on, all are ideas too complex and global in scope to put under the umbrella of aesthetic education. The interrelation of these kinds of variables in a doctoral thesis is unmanageable. Consequently, the author did not provide enough specificity to the kinds of experience prescribed in the various program modules and she did not describe how the attainment of an aesthetic attitude evolved as a result of the program content. Thus, it is evident that the focus of the study should have been trimmed and some statistical data developed to indicate that the program made a significant difference in the aesthetic attitudes of the students. (3) In this study, as in much art education thinking, justification for education in aesthetics and the arts is based on concepts and outcomes distinct from the realm of art. For example, the suggestion that artistic thought is a form of problem solving is a belief that if artistic thought can have the same

process and kind of intellectual status as science, mathematics, and othere ways of obtaining knowledge, then the value of art is more sensible. The characteristics of creativity (as defined by Torrance and others) are similar to problem solving, if one takes a careful look at the usage of the term, but the two terms have become construed to mean the same and are ambiguously or loosely applied as a description of artistic acts. Certainly Dewey, Bergson, Collingwood, Langer, and a number of other notable philosophers would not agree to this kind of theorizing. (4) The bibliography and appendices, which totalled one half of the thesis, were not integrally related to the foregoing text so that one who studies the curriculum program can gain clarifying information. Rather than presenting further criticisms, I would conclude that continued study, and even a refinement of this particular curriculum program, should be conducted. But, perhaps, what we should strive for in our efforts is to look for more modest results and to develop a venerable professional style in thesis studies. Improvement in the organization, content, and scope of this thesis is certainly needed.

THE EFFECTS OF VISUAL DEPRIVATION ON THE CREATIVE THINKING ABILITIES OF CHILDREN

Glennelle McCollum Halpin, Ph.D.
The University of Georgia, 1972

ABSTRACT

The purpose of this study was to determine if there are significant differences in verbal fluency, verbal flexibility, and verbal originality between (1) sighted children and residential and day school blind children, (2) sighted and residential blind children, (3) sighted and day school blind children, (4) residential and day school blind children, and (5) residential blind children only with respect to sex, race, and age.

One hundred and sixty-two children, Caucasian and Negro males and females, age 6 through age 12, served as subjects for this study. Eighty-one subjects were functionally blind; instruction in Braille was essential to their education. Sixty-one of the blind subjects were enrolled in residential schools for tthe blind in Georgia, Alabama, and South Carolina. Twenty of the blind subjects and all 81 sighted subjects were enrolled in public schools in Georgia.

The instrument used was the Torrance Tests of Creative Thinking, Verbal Form B, Activities 4, 5, 6, and 7, which yields scores on verbal fluency, verbal flexibility, and verbal originality.

The data were analyzed for the sighted and residential and day school blind subjects, for the sighted and residential blind subjects, for the sighted and day school blind subjects, for the residential and day school blind subjects, and for the residential blind subjects alone using a two-factor analysis of variance design. Factors included were seeing status, race, age, and type of school. For each factor there were two levels except for the age factor in some analyses where there were three levels. Both univariate and multivariate analyses were computed with scores on verbal fluency, verbal flexibility, and verbal originality as the dependent variables. The Scheffé method of multiple comparisons was also used.

In all comparisons between the sighted and blind subjects, significant differences were found in verbal fluency, verbal flexibility, and verbal originality. The means for the blind subjects were larger than the means for the sighted subjects. In the comparison between the sighted and residential blind subjects, the Race X Seeing Status interaction was significant for verbal originality in the univariate analysis and for all three variables combined in the multivariate analysis. The difference in the means on verbal originality between the Caucasian blind and sighted subjects was substantially larger than the difference in means between the Negro blind and sighted subjects. In the comparison between the sighted and day school blind subjects, the Age X Seeing Status interaction was

significant for verbal flexibility in the univariate analysis. The difference in the means on verbal flexibility between the blind and sighted subjects in the 9-12 age group was substantially larger than the difference in the means between the blind and sighted subjects in thge 6-8 age group. The main effect of age was significant in the comparison between the day school and residential blind subjects on verbal flexibility with the means for the 9-12 age group being larger than the mean for the 6-8 age group. In the race-age analysis for the residential blind subjects the mean on verbal flexibility for the Caucasian subjects in the 11-12 age group was significantly larger than all the other means, but the main effects of age and race were not significant.

Findings should be considered as tentative until more research on the creative thinking abilities of the blind can be conducted.

Order No. 72-34, 082, 147 pages.

REVIEW

Carmen Armstrong
Northern Illinois University

A study of the effects of visual deprivation is timely. The attention and sensitivities of many people are now focused on the needs and potential of exceptional persons. Concern has led to encouragement, opportunities, and assistance for persons deprived of one or more of the senses, to be able to learn and demonstrate the necessary competencies to take their place in and contribute to society. This study attempted to empirically demonstrate the creative potential of the blind, which can contribute, it was maintained, to their successful inclusion in society.

Though no less human and no less important than sighted children, being blind necessitates greater consideration and assistance for realization of their potential. If strong statements have prompted acceptance of this responsibility by our society since 1935 (White House Conference on Child Health and Protection, p. 5), it is high time that action replaces words, or, we discontinue hiding unwillingness to implement change behind expressions of sympathy. In light of the above, it is most important for research relating to the blind to maintain strict and objective standards in order to have greatest impact.

Statement of the problem. Although the Title and Introduction to this dissertation did not clearly identify the creativity being measured as verbal, the researcher did so in her statement of purpose (p. 3). That became an important delimitation of the study which was essentially ignored in the review of literature.

The significance of the study is supported in terms of the contribution of a general creative behavior to the mental hygiene, fully functioning personalities, educational achievement, vocational success, and social welfare of the blind. The need for creativity in these areas was tokenly supported in a general sense, leading to an assertion that:

> "It takes a little imagination to realize that the survival of our civilization depends upon the creative imagination of the next generation. Democracies collapse and die only when they fail to use intellectual, imaginative, creative ways to solve their problems." (p. 5)

One would not bother to dispute such an assertion due to its generality, but it represents paragraphs which do not importantly contribute to the theoretical basis of the specific problem. In contrast to clear and forthright statements of purpose, much of the significance of the study was based upon a strong advocacy position, probably, in an intent to be convincing. That research which was cited to establish significance, seemed to support the need for an experimental study in developing general creativeness in the blind rather than the descriptive study of verbal creativity that it was.

Research objectives. The research objectives of this study were clearly stated and were plausible areas for a descriptive study. Four of the five hypotheses deal with a specific blind population compared to sighted subjects, separately considering the possible effects of the independent variables - sex, age and race - on three creative traits - fluency, flexibility and originality. The research design for each hypothesis was clearly pictured in five figures giving the numbers of subjects in each source of variation.

Definitions of terms were clearly and adequately written with the exception of verbal originality. Torrance (1968) more explicitly explained the basis for the originality scores as a variable, weighted score based on the degree of infrequency (percentage) of responses as indicated in the TTCT scoring guide based on his norms - a procedure to be discussed later in this review.

This dissertation, while completely and precisely stating hypotheses, failed to lead up to them by logical support. First, the hypotheses referred to verbal creativity traits, but insufficient justification was given for omitting nonverbal parts of the total Torrance test. When the literature extensively reviewed by the researcher established a precedent for observing creativity of the blind using clay or paint, some adaptation of the Torrance tests to include figural content seems logical. Substitution for a coloring-book type linear drawing for one test was made by Torrance with an actual toy animal for the blind subjects. Similar reasoning would have enabled use of string or yarn "drawings" as stimuli and even a stylus and a plastic media, such as clay, for use of the figural tests.

Second, no exploration of the likely effect or noneffect of the type of school to which blind subjects went, nor program differences, substantiated separate hypotheses on that basis. There was no delimitation of the study justifying exclusion of intervening variables such social economic status, or differing testing conditions. The research objectives or hypotheses were answerable if one accepts the logic and methodological limitations to be discussed more fully.

Related research. In reviewing literature of the field which should have bearing on the problem, the researcher made reference to writers within six theoretical positions on creativity. Attention was focused, through the psychoanalytic theory, on the conditions which must exist for a person to be creative. In the discussion of some theories, relevance to the specific problem was lost (as in the review of Arnheim's or May's comments relative to creativity in the realm of nonverbal art forms, p. 26). If each theoretical position were to contribute in some way to the justification for the hypotheses or methodology, the reader is left to determine how.

One is left to infer that, of the theoretical positions reviewed, only the trait theorists have available instruments to adequately measure creativity. After the researcher reviewed the theories on creativity, the reader is left with little or no help in identifying in what ways the theories were incorporated, if at all, in the TTCT used or the study as a whole.

The researcher extensively reviewed the writings of Lowenfeld (1939) dealing with the creative styles and stages of blind persons working in clay and paint. Lowenfeld theorized two psychological types of blind persons on the basis of their approach in working with clay and painting, and reported observations to verify his theory. This represented an extension of his theory that most people have (biogenically determined) tendencies toward either haptic or visual sense perceptions.

A study by Rouse (1965), however, should create caution in acceptance of this theory. She found:

> "...a substantial number of subjects whose expressive styles were judged to be extremely different on different days, painting on one occasion as an extreme Haptic and on the other as an extreme Visual." (p. 51)

Beittel (1966) also reported large numbers of subjects switching working styles under the influence of instruction. So, the types of blind creators found by Lowenfeld have been challenged, and the relevance of Lowenfeld's work to the verbal creativity of blind subjects again a question.

The ultimate, specific implications of studying the verbal creativity of the blind were not stated. Lowenfeld's (1951) position was that a living could be earned better as well-adjusted individuals and that "...creative activity used as an emotional outlet helps them (the blind) in their adjustments..." (10:1).

This, and descriptions quoted from Guttman by the researcher of self duplication, formulation of the self, expression of imagery, autoplastic sensations such as muscular feelings, etc. do not match the trait definitions by which Guilford and Torrance describe creative behavior. It would have been helpful if the researcher had limited the field to those studies that contributed to the logic of the study.

Methodology. Although it is not clear whether or not the blind students constituted a chunk sample of blind students at the schools involved, each age group (between 6-12 years) was represented in the blind sample from each school. Both Caucasian and Negro subjects were represented, but all Negros, with one exception, were residential students. Causes of blindness and ages at which blindness occurred were accounted for, and would not seem to interfere greatly with the results of this study.

The blind subjects were matched to sighted subjects with similarities in age, sex and race in keeping with the research objectives. However, no rationale was provided for matching inclusively and exclusively on these variables. If Torrance (1966) recognized the power of social and cultural factors in causing discrepancies in verbal and figural performances, then it would have been logical to match the blind and sighted subjects on socio-economic status or certain value-laden variables. In a study by Smith (1965), using verbal tests for fluency, flexibility, and originality derived from Guilford's battery, higher socio-economic status correlated positively with high performance on the tests. McGuire (1961) found divergent thinking varying significantly from one community to another.

In addition, the sighted subjects were "randomly selected from the normative data available for the Torrance tests of Creative Thinking" (p. 46) gathered from Georgia public schools between 1967 and 1970. Besides ambiguity as to the means of selection, the time factor enters. One could expect cultural change over a span of five years to influence responses on the TTCT and as a result the usefulness of the scoring guide.

In comparing group means of this study with the only normative data available in the test manual for TTCT Verbal Form B, (small town, rural Wisconsin), it is disclosed that the means for the sighted subjects of this study are generally much lower than the norms. To definitely rule out the chance of a basic intellectual difference, students should have been matched also on intelligence. It is unusual to, by random selection of sighted subjects, consistently come up with sighted mean creativity scores that are lower than norms. Those subjects for whom (blind or sighted?) intelligence scores were available had correlations of .21 to .37 with creativity trait scores (p. 18) which are higher than on Wallach and Kogan data, for example. It should be noted that the full 81 sighted subjects were used for testing hypotheses dealing with blind subgroups and therefore, the study did not have matched subjects for the day-school blind and sighted comparison where not all subgroupings were represented.

Convenience would seem to be the only reason for using control data: (a) gathered at varying times; (b) by other investigators; (c) under unknown specific conditions: (d) without specifying the randomization procedures; and (e) using it to match individual blind students omitting variables of likely influence. It would be appropriate to clarify the similarity or dissimilarity of the schools from which the sighted sample was taken. If children who do not have the mental ability to profit from instruction (p. 43) are not accepted in the residential schools for the blind, were the several school situations comparable? If as the researcher stated, "...special emphasis is given (in the residential school for the blind) to music, physical education, arts and crafts, and vocational subjects" (p. 43), the novelty of the test situation should not have influenced higher scores as Elkind, Deblinger, and Adler (1970) found could happen Few public schools offer the emphasis noted in the residential school for the blind, however. Some argument can be built for this possibly not being a factor by considering the constant results of residential and nonresidential blind subjects. However, Torrance (1966) does claim that motivational conditions can be expected to effect reliability, and Dentler and Mackler (1964) and Crockenberg (1972) have found that relaxed conditions have produced significantly higher creativity scores. If, conditions of the residential school, or the way blind children are helped in a day school (described as relaxed), can have a positive effect on creativity, higher verbal creativity scores might be expected than norms found for sighted subjects in a public school.

The researcher reports that interrater reliability was established on fifteen, randomly selected tests, and scored by both researchers and one of Torrance's trained scorers. Common practice would suggest having established interrater reliability prior to judging tests and on tests that are not part of the sample.

As mentioned, two to five years lapsed between testing of the sighted and blind groups. In addition, the blind subjects completed only Activities 4, 5, 6 and 7 of TTCT, Verbal Form B, and scoring on elaboration was omitted. All of these facts cause questions concerning the means of establishing interrater reliability. Interrater reliability across the sets of judges did not seem to be considered. No explanation is offered for claiming reliability based on partially different tests.

The Torrance Tests for Creative Thinking used in this study have come under widespread criticism. Considering this, it seems that the researcher, if convinced of their validity, would have responded to those well-known criticisms or would have demonstrated, by her own tests, that the tests, as used, were valid.

Particularly questionable are the scoring methods employed for ascertaining originality scores outlined by Torrance (1968) in his test manual. Percentage infrequency based on fifth grade norms, and Torrance's (unsupported) procedure of weighing of responses, determines whether responses of subjects in grades K through graduate school are scored as original. Originality is a sum of credits with less common responses getting a unit score, and in some cases, responses occurring only in 1.00 and 1.99 percent of the records getting a weight of five. The lists in the manual are limited and considerable judgment seems to be left to each judge. It is sometimes difficult to ascertain whether to credit as original, a response which might have been in the common experience of one group, but which is uncommon elsewhere. It would seem logical to tally responses in a study, calculate infrequency, and compare to the norms and scoring lists as a check. The procedures described might explain the fact that originality mean scores of the blind subjects in this study were approximately 75% as high as the simple frequency of correct responses. As such, they would not seem to be reflecting the relative incidence of originality in real-life situations. Also, problems often occur with determining appropriateness of novel responses, (not simply bizarre or odd). The researcher did not give evidence of concern over this question which Jackson and Messick (1965), consider important criteria. Since it is possible that experiences outside those on which norms were based could possibly influence responses to be considered "inappropriate", it would have been reassuring to have exposed more of the actual examples and non-examples which characterized the blind subjects, so verbally creative in this study. No measures were taken to allow examination of the types of responses that were judged to be flexible, original, and yet appropriate.

Whereas means of groups of subjects are reported, no idea as to relative distributions or spread of scores can be gleaned, since standard deviations are not reported.

Although the numerous citings of demonstrated construct, concurrent, and predictive validity of the TTCT are rather convincing, one need only refer to recent extensive reviews by educational researchers to feel the need for greater demonstration of validity in the present study, (Crockenberg, 1972; Harvey and others, 1970; Feldman, 1972; Moss and Duenk, 1967; Smith, 1965; and Stallings and Gillmore, n.d).

One serious criticism of the test instrument used in this study is that the traits defined have not been demonstrated to have dimensional independence. Harvey and others (1970) and Stallings and Gillmore (n.d.) have found much greater between-trait correlations within tests (.54) of the TTCT than within-trait, across-tests (.27) correlations. In spite of definitional differences, the traits do not call for demonstrated differences. Using these instruments to identify traits, then proceding ahead without establishing validity at this point, to combine the scores and claim "creativity" is a questionable practice. The score may be a measure of something, but not, convincingly, a composite of creative traits as defined.

Stallings and Gillmore did not find significantly greater correlations between the TTCT figural creativity variables and grades in fine arts courses than between those grades and ACT scores. Torrance (1966) had suggested that if subject matter were acquired in creative ways, one could expect high correlations between the creative thinking measures and achievement. Either construct validity of the TTCT is questionable or creativity is not rewarded by high grades in the fine arts courses used in his study.

Although Moss, Thorndike and others have criticized the TTCT for lack of predictive validity, Torrance has attended to this need and offered in his 1974 manual more evidence in this area. At the time of this research, however, little basis existed for championing scores on the TTCT as predictive of real life, socially valuable, creative behavior.

A shortcoming, related to the method of collecting the data, can probably be attributed to feelings of empathy for the plight of the blind subjects to which anyone personally acquainted with one or more blind individuals may be subject. The case for the blind can more strongly be made, however, by adhering to and reporting the most objective approach to the administration of the tests (and whole research design). For example, according to Crockenberg (1972), self-motivation is an important determinant of creative behavior in a non-coerced environment. But, if blind students in this study were made individually comfortable, tests were administered with directions being given "without regard to the amount of time consumed in order to insure that the blind child understood the tasks" (p. 59), and an adult wrote the responses for the subject, then, what were the conditions under which the tests were administered to the sighted sample? Can we assume all administrations of the test had the same type of supportive, personally attentive, and psychologically safe environment? Is this a non-coerced environment?

In order to combine and analyze the data, the researcher correctly converted raw scores to standard scores. The researcher relied on Torrance's conversion tables established for assessing originality, on 5th grade data prior to 1966 without establishing its similarity to the data gathered. Group mean T-scores thus derived were presented without raw score means and standard deviations by which to view the spread of scores of each group.

Results and discussion. The researcher drew accurate conclusions from the data provided by the study and cited supportive research results. She recognized the possible advantage of the blind student over the sighted due to the creative-growth-fostering environment of the blind who need to develop self-sufficiency and imagination for survival. The limitations of the study cited attest to the researcher's awareness of some factors which could qualify conclusions drawn.

Commentary. Without detracting whatsoever from supportive recommendations of the study, if better performance of blind subjects is attributed to their creative growth fostering conditions, then, would another logical recommendation growing out of these findings be to approach general education of sighted humans in a similar way in order for latent creativity of sighted humans to be realized and detected? If, as Baird points out, the predictive validity of TTCT needs to be firmly linked to reality by showing that it predicts socially valuable, creative behavior, and the adult sighted environment serves to impose limitations on the achievement of creative blind, what effect does it have on sighted individuals? The reviewer is not the first to ask if encouragement of creative behavior is unrealistic for children - sighted or blind. Could global encouragement and misconceptions related to the self-expectations of the blind lead to intolerable disappointment in the harsh realities of the working world?

In the light of the criticisms leveled, this reviewer is not satisfied with the statement offered by the author that "This study has provided evidence that the blind are more verbally fluent, flexible, and original than the sighted" (p. 112), and emphatically underscores researcher's own later caution of tentativeness (p. 124). More stringent standards are encouraged in regards to: (a) delimitation of the study and literature, then adherance to concerns reviewed from the literature; (b) closer criterion definition-instrumentation relationship; (c) improved research methodology including use of appropriate independent variables; and (d) more self-discipline, avoiding vacillating back and forth in terminology which lends to the misconception that the findings of the study as discussed pertain to general creative activity.

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REVIEWER

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ARTS RESEARCH SUMMARY

RESEARCH IN MUSIC EDUCATION

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Introduction. We begin this report by citing two of the basic problems confronting research in music as an art and in music education. The most basic problem, and the most troubling to many musicians, lies in the essential conflict between the nature of art and the nature of science, between artistic behavior and scientific behavior. Art represents a unique way of doing; science, a unique way of knowing. The product of art is an object; the product of science is an idea.

Research must be well controlled and objective, but art is by its very nature free and subjective. Reducing an art to the degree of simplicity necessary for research may result in the loss of the essence of the art. This conflict is, however, resolvable if both researchers and musicians arrive at an understanding of the relationship between science and art. A scientific approach to art involves a search for a reliable idea and verifiable knowledge regarding the nature of the art object, the nature of artistic behavior, or the nature of art experience. The researcher establishes hypotheses concerning art and either verifies or negates them by obtaining verifiable knowledge in which he can place a high degree of confidence.

A second problem lies in the limited number of researchers who are knowledgeable in both the art of music and the scientific method and who sustain their research effort over a significant period of time. The bulk of research in music and music education is done for doctoral dissertations, and the dissertation too frequently represents the single research effort of a lifetime. This problem, too, is solvable and, indeed, progress in overcoming it has been made in recent years. Its solution lies in the early identification of musicians with a scientific bent and developing their musical and research competence through a well planned program of undergraduate and graduate study that includes continuing authentic research experience. An essential corollary has to do with the provision of financial support for music researchers by universities and other funding agencies.

Having identified these two problems, we proceed to review research of the past decade and to establish a rationale for conducting research during the next ten years by formulating what we view as the major broad research questions on which research should be focused.

Related literature. The work of Carl Seashore at the University of Iowa in the first third of the twentieth century stands as a landmark in the history of research in the psychology of music. He carried on his work in the measurement of musical aptitude with a degree of thoroughness and scientific rigor unique in his time and enviable today.

Although Bingham[2] shortly after the turn of the century had written a theoretical paper on melody and its functions, and the British psychologists Lowery[3, 4, 5] and Mainwaring[6, 7] had initiated research on music concepts such as cadences and phrasing, their work had little significant impact. Seashore's elements approach to musical aptitude, however, appealed to researchers: elegant research designs could be set up; sophisticated statistical techniques could be used; and a variety of interesting laboratory hardware could be incorporated. Researchers who tried to deal with larger musical entities or those more closely related to real music, on the other hand, produced fuzzy and inconclusive results.

A continuing controversy arose between Seashore[8] and Mursell[9] who gained prominence in music education in the late thirties. Mursell criticized the Seashore *Measures of Musical Talent* for their atomistic conception of musicality and aptitude and their mechanistic approach to measurement. Mursell became the most influential authority in music education, the only productive market for aptitude tests, and his powerful opposition to the use of tests constructed on the Seashore model served to stifle further research in aptitude testing. With the departure of Seashore from the scene, an unfortunate hiatus in research in the psychology of music occurred and lasted until mid-century.

The nineteen fifties saw a resurgence of interest in the psychology of music and in a broader field of research encompassing many aspects of music teaching and learning. While the reasons for this resurgence are not clear, the sudden growth of doctoral programs in music education was certainly a factor along with the great strides in research design and statistics achieved by researchers in psychology and education. The resurgence was signaled by a growth of interest in research on the part of the Music Educators National Conference. A group of doctoral advisors began to organize sessions on research at meetings of the Conference and in 1953 initiated the publication of the *Journal of Research in Music Education* by the Conference.

The resurgence was solidified by the publication of the *Musical Aptitude Profile*[10] developed by Edwin Gordon at the University of Iowa. On Gordon's initiative, the University of Iowa reinstituted publication of *Studies in the Psychology of Music*, a publication which had brought the bulk of Seashore's work into print but had been dormant since Volume IV was published in 1936. Volume V, published in 1967, was devoted to studies investigating various aspects of the *Musical Aptitude Profile*. The series continued through Volume X but suspended publication for a second time in 1975 subsequent to Gordon's departure from the University of Iowa.

Achievement testing in music received considerable impetus as the result of the publication of the Colwell *Music Achievement Tests*[11] in 1967. This battery of tests represented the first effort to base a standardized music achievement test on behavioral objectives established for a school music series. MAT has been widely used in research studies to secure data on the musical achievement of subjects ranging from elementary school pupils to college music majors.

Funded research. Most of the large-scale research sponsored in the 1960's by the U.S. Office of Education under the Elementary and Secondary Education Act was not concerned with controlled inquiry into fundamental problems of musical learning. It was, on the other hand, designed to develop new curriculum materials and innovative approaches to musical learning. Many of the materials produced were superior to those in prior existence; some were based upon improved, more carefully thought-out goals; but, without any follow-up in the form of systematic evaluation and without any long-term commitment from the schools for which they were developed, their effect was ephemeral.

Interest in the production of new teaching materials received a powerful impetus from the Yale Seminar on Music Education of 1964. Although the participants in the Seminar were not, for the most part, interested in doing research themselves, they stimulated widespread ferment by their outspoken and penetrating criticism of the status of music education. This criticism, together with the general dissatisfaction with public school education at that time, resulted in at least 65 major projects in music education and numerous smaller endeavors funded by grants from regional offices. Among the undertakings which had some long-range effects was Reimer's General Music Curriculum[12], which resulted not only in an influential final report but in a new technique for teaching music appreciation. Reimer carefully differentiates between aesthetic perception and aesthetic reaction. He sees music as a means for exploring human feelings and establishes levels of difficulty for exploration in continually more sophisticated settings. His study offered evidence of the successful use of certain pedagogical arrangements of materials, most notably the use of the exemplar approach in which extensive use is made of a few selections which are returned to again and again in cyclical fashion with greater understanding and deeper perception expected from the student upon each return. At the college level, Reimer's ideas have been incorporated into a music appreciation text[13], and at the public school level into a music series for grades one through eight[14].

A second influential project funded by the USOE was the string project of Paul Rolland[15]. Rolland and his colleagues developed a method of teaching strings which represents an American adaptation of the Suzuki method. A wealth of teaching materials was produced - including films, records, methods books, drill materials, and some minor hardware - which continue to be widely used.[16, 17] Workshops held in Great Britain as well as the United States have demonstrated the teaching method and introduced the materials to teachers. Two other government funded projects resulted in published materials: Roger Sessions' repertory for grades K through 6[18] is designed for classroom use and for vocal and instrumental ensembles. It is an impressive collection of nearly 230 short vocal and 53 short instrumental compositions, categorized by period from pre-Renaissance to contemporary and folk music. It offers no pedagogical arrangement nor a method; the value of the publications resides in the nature of the compositions: high musical worth, varied stylistic representation, brief and simple enough for elementary school children. Among the USOE grants, the Manhattanville Project[19] of Ronald B. Thomas attracted the most publicity and received the

greatest attention due to its radical departure from traditional modes of school music instruction. Through numerous demonstrations at conventions and workshops, the Manhattanville scheme has had a genuine impact on the procedures and goals for music at every educational level, though its complete adoption has occurred in only a limited number of situations. Briefly, the method approaches music instruction through improvisation, composition and experimentation, and emphasizes the use of contemporary sounds and compositional devices.

Unfortunately, no data are available on which to base objective judgments of the educational merits of any of these materials and methods. They can be appraised as interesting, or musical, or provocative, or with some other value-weighted adjective, but not in terms of actual results compared with the results of using other materials and methods. Music education curricula have yet to face the standards imposed upon curricula in other subject matter areas.

Systematic, long-term research into musical learning is only possible with government support. Two research organizations in the United States have received their support from federal monies. These are the CEMREL Aesthetic Education Program with which readers of this paper are already familiar and SWRL (Southwestern Regional Laboratories) Education Research and Development Laboratory. The rationale for the research at SWRL is contained in a working paper by Williams and Carlsen dated 1974.[20] Their concern is primarily with children's listening skills. Emphasizing skills related to melodic, harmonic, and rhythmic perception, the research has been concentrated on how children identify melody in terms of motion and shape, motivic expansion, and formal organization. Some studies have had to be as basic as determining the extent to which children can identify the direction of melodic intervals - up, down, or same pitch. The effect of timbre and loudness variation on the child's perception of melodic interval motion is studied. Also investigated with K through 2 children is the effect of their initial proficiency levels and response mode training. This work uses the SWRL audio laboratory with a programmable pitch generator, earphones and visual stimuli presented by a programmable slide projector. It may be thus categorized as basic research rather than applied research. The psychoacoustical aspects are illustrated by one of the findings: when a timbre shift is made from triangle wave on the first tone to square wave on the second, a child's ability to identify melodic direction is affected.

Research on music teaching and learning. This section contains a brief summary of the findings of recent research in various aspects of music teaching and learning. These aspects will be presented as: method, developmental or maturational studies, the effect of training, attitudes, perception, automated learning, creativity, psychological theories, and aptitude. Taken together, they form a fairly complete picture of the present status of research.

A large number of curriculum studies completed as doctoral dissertations have established that the application of different methods does not affect learning. On the surface this is a surprising finding, for an author's method profits from the halo effect and novelty, and possibly as well from some bias on the part of study participants. This finding is, however, consistent for different age levels, for different media, and for researchers at different institutions.

Siemens (1969)[21] compared the Orff method which traditional methods of teaching and reported attitudinal differences in favor of Orff but knowledge advantages in favor of the traditional methods with other musical learnings equivalent. Other studies which resulted in no differences are: Ruth Keraus (1973), Suzuki violin instruction;[22] Zumbrunn (1969), 20th Century Art Music;[23] Klemish (1968), music reading using a vocabulary of tonal patterns;[24] Goewey (1969), use of line scores in listening;[25] Palmer (1974), a comparison of Kodaly and Gordon syllables for music reading;[26] Lowe (1973), violin tone quality: long bow- and short bow-stroke;[27] and Ware (1968), music appreciation: three organizational plans.[28] The Ware study raises some interesting questions for teacher education. The three plans used were (a) music taught by the classroom teacher, (b) music taught by the music specialist and (c) music taught by both types of teachers. Measurement by the *Oregon Test of Musical Discrimination* revealed no difference among the three plans. Test developers confirm this finding: classes taught by classroom teachers perform as well or better on tests than those taught by music specialists, markedly so in the lower elementary grades.

One study of methods of teaching pre-school children attained similar results. Greenberg, studying the Hawaii curriculum project's pre-school program (1974) found no differences in the results of his curriculum and the traditional program.[29]

Perhaps these efforts have been futile because the tests lacked curricular validity; perhaps, because the diversity already present within one class was greater than the difference which would result from the teaching method - diversity springing from environmental, aptitudinal, or other factors; perhaps, because no consideration was given to the role of maturation; or perhaps, because the goals were too ambitious for the time limits of the study.

Research on development and maturation. Paul Michel of the DDR (German Democratic Republic) is making a significant contribution to the music education profession with some basic research and some well-informed speculation. Charged by law with developing an effective music curriculum for all East German children, he is making an effort to find the optimum conditions for musical development. One goal is to find realistic upper limits of achievement for each age without imposing excessive and injurious demands upon children. He rejects the artificial stages of Piaget and any fatalistic nativistic determination of musical aptitude. He further refutes the ideas of Revesz that the first year is of little importance; rather his research indicates that the first six months represent the period in which a child learns to hear. Two different timbres can be distinguished by the age of 2 to 3 months, pitches can be distinguished by the second half of the first year, and the child can begin to sing a few notes with the mother by the end of the first year of life. By the time he enters school, the student has developed the ability to hear and listen to major and minor modes.[30] Michel's research places in doubt the belief that children go through a pentatonic stage of development. With the exposure that children have to varied sound sources at home and school, and from television, radio, and cinema, they use the triad for their creative activities. Each child will develop if he is engaged in the proper activities, but the teacher must offer the right learnings at the right time. For language training, the child is language sensitive at ages 3 to 5, during which period he learns in a reproductive-imitative manner. For the development of vocal and auditory abilities, it appears to Michel that the peak period encompasses the fifth and sixth years.[31]

A skill area which has fascinated musical researchers is that of perfect pitch. Following Michel's dictum of teaching the right thing at the right time, Sergeant's ex-post facto study of the development of perfect pitch in 1500 musicians[32] attempted to determine whether a relationship exists between the age of initial music instruction and the possession of perfect pitch. His results indicate a rather linear progression based on the age of first instruction. Those whose musical study began at the age 2 to 4 usually had perfect pitch; more than 90% of Sergeant's sample fit into this category. Those whose study began as late as age 12 to 14 possessed perfect pitch in only 5% of the cases. This study, like many nonexperimental efforts, is plagued by the impossibility of determining causation. The capacity for perfect pitch may in most of the cases studied be part of a complex of talents which led to early music study. Once again we reiterate, as did Kwalwasser, that training attracts the talented.

Over the course of the last 75 years, some experimental studies have attempted to teach perfect pitch. For the strict behaviorist it is necessary that perfect pitch be teachable and learnable. Limited success has been reported, usually with very small samples. With the plethora of musicians in this world who would like to develop perfect pitch in themselves and their students, we can safety conclude that no widely successful method has yet been found for any age level, else we would have heard the great news sung out - on a perfect A- 440, of course.

A number of studies have dealt with aural perception and/or discrimination at various age levels. Seashore believed that the pure elements of ability would not improve with practice or maturity but his selection of the elements as well as his findings regarding their stability are still open to question. Among Seashore's pure elements are pitch, loudness, timbre, and rhythm. The following studies include one or more of these elements. Spencer[33] tested 80 students between the ages of 2½ and 6 years, and concluded that the ability to match pitch and the ability to rhyme did not improve with age during the years with which the study was concerned. Bridges[34] studied harmonic discrimination in children in kindergarten through the third grade, and states that children possess this ability in varying degrees both within and between grade levels, but that at the kindergarten level the instances of this ability may well be the result of chance.

Thackeray (reported 1973)[35] believes that children develop a harmonic sense before age nine. They can discriminate between a single tone and a chord. It is much more difficult, however, for them to tell whether a chord heard is repeated in a sequence of chords, or whether the harmony remains identical for a repeated melody. Working with children from grades 2 through 8, Schultz (1969)[36] evaluated responses to melody, rhythm, tempo, instrumental timbre, mode, and key change. He found steady improvement in ability with a plauteau at grades 5 to 7; conservation of melody was the most difficult. This study begins where most studies cease - at the age level (approximately 8 years) where conservation occurs - and was not concerned with the preoperational stages which Piaget assigns to the earlier years. Another study dealing with conservation is that of Lawes (1971)[37] who tested children at kindergarten, second, fourth, and sixth grade for conservation of pitch patterns in rhythmic transformation. He concludes that no special stages exist, that children improve by grade level.

The work of McDonald (1970)[56] was an effort to determine the effect of socio-economic class on the development of musical concepts. She found that middle class students could handle concepts more easily than lower class students due, perhaps, to a significant relationship between mental age and the formation of musical concepts. She found identification of pitch the most difficult, discrimination of loudness the easiest.

In a well-designed study, Dittemore (reported 1970)[38] explored development of pupil achievement in a well-structured music program. He concluded that at first grade, musical capabilities are developed for minor mode, duple and triple meter; at second grade for major mode, dorian mode, mixed meter, round, and counter-melody; at third grade, unusual meter and two-part music. His research on the concepts of nontonal music and three-part music was inconclusive. Compared with the findings in other studies cited, Dittemore plainly shows the influence of a well-structured educational program in music. For all the developmental studies, the element of training and experimence enters in; in the research to be discussed below, training is the focus of the studies.

Research on training. Success with training has been reported primarily by the behaviorists. Greer and his associates at Teachers College have reported (1973)[39] a number of studies which achieved moderate success as long as the correct responses were associated with high teacher approval. One study[40] reported significant improvement in vocal intonation when the behavior was reinforced, with the type of music used being unimportant. Another study at Teachers College[41] found that the greater the number of approvals, the more the ability to match pitch improved. They conclude that more rigorous programs would result in increased achievement. Another Greer study (reported 1974)[42] provides evidence that the period from third to fourth grade is a pivotal one for the formation of musical state, thus reinforcing Petzold's conclusion that this is an important period for the acquisition of other musical behaviors as well. The conclusions of Taebel (reported 1974)[43] regarding the effects of instruction on children's conceptual abilities raise some interesting questions about the Piagetian theory. Taebel found large individual differences within grade levels, often larger than those between grade levels, suggesting that factors beyond simple maturation are at work, though age seems to be the major single factor. He found that ability to hear dynamic differences is greater in children than ability to hear pitch differences. Confirming the work of Petzold, he found little change between single grade levels, and minimal growth between first and second grades. In England Sam Taylor (1973)[44] studied children aged 7 to 11. He found that for ability to perceive melody, rhythm and harmony, age rather than training made a consistent difference, except in the case of rhythm where perception did not improve between the ages of 10 and 11. Training seemed to have relatively little effect on perception of musical elements, on ability to discriminate which piece was error free, or on preference for types of music. A perspective on these studies may be gained from the work reported by Piper and Shoemaker (1973).[45] Their investigation indicates that without any training, kindergarten pupils can distinguish between same and different phrases, identify gross features of melodic contour such as ascending and descending lines, distinguish between accompanied and unaccompanied music, distinguish between fast and slow pulse, and

distinguish between loud and soft dynamic levels. The above list is a close approximation of those objectives often given for the first three grades, objectives by which the various methods of instruction are compared. Romenek's study (reported 1974)[46] tends to reinforce the findings of Piper and Shoemaker. Working with a self-instructional program for pre-school children in singing, listening, performing, and moving to music, she found that the children had a well-developed concept of loudness but were much weaker in pitch and duration. She suggests that instructional activities do not result in learning to the extent that teachers believe they do.

Research on attitudes. In the area of attitude and appreciation, research findings are similarly largely negative. Schukert and McDonald (reported 1968)[47] attempted to modify the musical preferences of four- and six-year olds, and though they were partially successful, their data for change were not statistically significant. Duerksen (reported 1968)[48], working at the other end of the educational ladder, had similar results with college students, finding that both preference and ability levels change little between high school and college. He asks the disturbing questions "Why is there little average change with increasing class level? Is the only discrimination a college music major learns a better liking for rock and roll?" Several studies reveal the lack of positive results for appreciation at the elementary school level. Oberdin (reported 1967)[49] used notation to assist fifth-grade students in remembering thematic material, but without success. Two studies by Nolin, several years apart (reported 1967[50] and 1973[51]) indicate that music educators may not only be failing to improve appreciation of music and attitude towards music, but may indeed be fostering negative attitudes. His results in both studies are almost identical to those of an earlier study by Broquist (1961)[52] in which positive attitude toward the study and appreciation of music appeared to decline with age. Wragg (1974)[53] reported a similar decline in interest between elementary and secondary school.

Research on perception and psychoacoustics. Two rather significant research endeavors offer sizeable data on perception in music and perhaps provide some future directions. Heller and Campbell, working at the University of Connecticut, (reported 1976)[54] argue that music is a formal system which is derived from the structural component of natural language. Their belief is that we must understand the elementary aspects of musical patterning (such as the child's conservation rules) before we can understand musical behavior and conduct research in this area. They argue that we need a theoretical model of musical perception, that basic model building and testing are presently needed which, when accomplished, can lead to structural and functional models that can be tested. Based on their present work, they suggest that musical patterning depends upon implicit formal operations; that is, aesthetic response is the result of a cognitive, intellectual process. There is a relationship between musical perception and musical intelligence; basic problem-solving is the same in music as in other areas. Their matrix suggests that the human can respond to music from auditory or notational stimuli and to the macro or micro elements - macro elements being the formal elements for which we presently have symbols and micro elements including the interpretive aspects of music such as stress, change of timbre, and so forth. As music is a natural language, we should expect form to take precedence over content.

The larger area of perception as it overlaps into psychoacoustics has received attention from numerous researchers in the past decade. An excellent summary of the status of research in this area is provided by Juan Roederer.[55] Although much of the research does not pertain to musical responsiveness, there are aspects of the field of psychoacoustics which hold potential enlightenment for the musician who wishes to understand more fully the nature of the musical response. The following list touches briefly upon the studies pertinent to music.

The complexity of tuning was demonstrated by Swaffield (reported 1974)[56] in a study that found tuning to be dependent upon timbre, intensity, duration, and relative frequency. Although we continue to equate pitch with frequency, in common-sense layman's terms, Leonard (1967)[57] demonstrated that pitch discrimination was affected by register, intensity, timbre, duration, context, and inter-stimulus time interval. Working with instrumentalists, Greer, whose studies usually focus on a practical problem, assessed the effects that different timbres have on a subject's ability to match pitch (1970).[58] Haack (reported 1975)[59] and Stephenson (1971)[60] have investigated the influence of loudness upon musical perception; Branning (1967)[61] and Sisson (1969)[62] studied tuning preferences using various ratios including just intonation. Pythagorean, and Equal temperament. The complexity of musical perception is illustrated by the diversity of these pieces of work. Although the quantity of information contributed from any single study is minute in comparison to the immensity of our ignorance, the amount of activity in the field of perception will surely produce results we will find useful in teaching for musical responsiveness.

One might speculate that music researchers have concentrated their efforts on the wrong elements of musicality. For example, the importance of a factor which is termed musical cognition is pointed up by the research of McLeish. The basic study was completed some 25 years ago but was not reported until after it was replicated in 1965.[63] From a careful factor analysis of the Seashore, Wing, and Oregon tests, McLeish concludes that the important factors of musicality are not those usually identified as pitch, duration, timbre, etc., but there is a single important factor of musical cognition - the ability to recognize and understand the nature of changes in musical or quasimusical materials.

Research on automated learning. In any review of significant research over the past decade, automated learning legitimately requires a place. Walter Ihrke is in many senses a pioneer in this phase of exploration and innovation. One of his earlier articles appeared in the Spring 1963 *Journal of Research in Music Education* and other articles appeared around the same time in the *Bulletin of the Council for Research in Music Education*. Before others had given automation much serious consideration relative to musical learning, Ihrke suggested that one of its real advantages would be in forcing educators to take a new look at what needs to be taught and the sequence of presentation. He further suggested that to compare automated training with that offered by the traditional teacher approach may hold little profit because the human approach has not been very effective. Researchers into automated learning, however, tend to make just this comparison, since no other type of comparison is possible unless it be with a second form of automation.

The most sophisticated hardware system PLATO, resides at the University of Illinois. Two studies done there are designed to exploit the capabilities of the computer. Done by Peters (1973)[64] and Placek (1972),[65] they establish the fact that the computer is a feasible tool for teaching musical learnings. Whether such findings will result in general use of the computer for this purpose is a question that has yet to be answered. A number of other computer assisted instruction (CAI) programs have been devised by researchers working in places as varied as Buffalo, New York; Utah; Kansas City, Missouri; and Evanston, Illinois. These deal with such phases of learning as: music theory (Hulfish, 1969),[66] sightsinging (Thompson, 1973),[67] general music (VonFeldt),[68] and the sight-reading of rhythm (Mortenson).[69]

The invaluable nature of the computer as a bibliographic aid to researchers is just beginning to be recognized, with three of our major storehouses of information established around the United States. In addition to Datrix, ERIC, and the social sciences index, the system being built at the University of Georgia is expected to contain an exhaustive coverage of music (Edwards and Douglas, 1972).[70] Presently, however, there are a number of good summaries found in publications of the past few years which offer the opportunity for qualitative judgment. These will be listed towards the end of this article.

Research on creativity. The area of creativity, which seems such a fertile field for research, has been all but totally neglected in the past few years. Two studies deserve mention, both of them larger in scope than the bulk of those included in this article. Supported by government funds, Kyme (1967)[71] explored the contribution of musical composition to the development of musicality in junior high school. He found the traditional instrumental program the most universally effective in developing musicality; composition was more effective as a tool at the higher socio-economic levels than elsewhere throughout the social spectrum. An attempt to evaluate objectively the effects of the Comprehensive Musicianship Program was made by Boyle and Radocy (reported 1973).[72] They identified 13 outstanding and representative teachers for this project. Criterion-referenced tests were constructed for each teacher depending upon her/his objectives for the CMP program. The *Music Achievement Tests* of Colwell were selected as the standardized tests to provide base line data. Students within the CMP did show improvement as measured by the criterion-referenced tests and MAT. But, in summary, the researchers were forced to ask whether the objectives of the program and/or the testing tools were too difficult; whether the teaching was of poor quality; whether their evaluative procedures in some manner prevented accurate measurement of criterion attainment. Achievement fell far short of what seemed to be reasonable goals. The study confirms once again how little we really know about the factors entering into musical learning. It points up the futility of developing new methods without first answering the basic questions about musical response, musical learning, and musical teaching, and the further question of accurate evaluation in these areas.

Research on psychological theory. In 1963, it was suggested by Leonhard[73] that music educators attempt to apply psychological theories as a means to finding more successful teaching insights. The earliest such study was that of Pflederer (1963)[74] who took the Piagetian principle of conservation and applied it to responses children made to a set of musical tasks. The study was an influential one; Pflederer expanded the project into the federally funded work with Sechrest already mentioned. A number of other pieces of research on conservation followed, most of which have been referred to earlier.

Other psychologists whose ideas have been applied to aspects of musical learning are Ausubel (Hieronymus, 1967)[75] and Maslow (Harvey, 1974).[76] Harvey's study focused on correlating Maslow's concept of self-actualization with creative teaching. He concludes that we need to investigate teacher personality more carefully, insure a student-centered program with more creativity throughout, and develop an aesthetic foundation for teacher education. A valuable summary of several theories is contained in the Katz work (1972), "The Arts as a Vehicle for the Exploration of Personal Concerns."[77] Investigating the work of William James, Abraham Maslow, Carl Rogers and Clark Mouspakas, he concludes that an acute objective perceptual faculty may be one possible key to helping the adolescent acquire a unique and satisfying personal identity and to help him better understand himself, others, and the relationship between the two. Katz cites Erik Erikson and David Elkind to support a curriculum based on experiences in perception for the adolescent.

A project which has as many philosophical as psychological roots is the Harvard Project Zero, directed by V. A. Howard (reported 1970).[78] A long-term endeavor, its purpose is, first, to analyze and classify the types of symbol systems and symbolic reference which are characteristic of different art forms. The second phase involves the experimental study of the skills and abilities required for the manipulation of art symbols, and the third phase is to determine methods of nurturing and training those abilities. When the project comes to maturity, it will have much to offer music education as well as education in the various other arts.

One of the more serious researchers is Edwin Gordon of the University of Buffalo. Gordon is concerned with the teaching and learning of tonal and rhythmic concepts. In order to investigate these aspects of musicality he has developed a music aptitude test and six levels of a music achievement test. In the work of his students these instruments have been used and scrutinized, providing us with one of the better data bases from which to speculate on the future. Gordon has pointed up the importance of aptitude in his longitudinal study of musical achievement of disadvantaged students.[79] He found that disadvantaged children, with talent, can succeed in spite of their background and the quality of the schools they attend if identified and given a chance. In fact, they do as well as advantaged students with the same talent. He is arguing for the importance of providing training to those who can profit from it. His work and that of DeYarman[80] continue to attest to the early stabilizing of aptitude. DeYarman holds on good evidence that aptitude is stabilized by the age of six and that the level of musical aptitude is not influenced by early school exposure to music.

Using the ITML, DeYarman[81] and Miller,[82] in separate studies, investigated the effect of instruction on achievement test scores. Confirming the general thrust of this article on how little we know about the effect of instruction, they used music with mixed meter with kindergarten and first grade children and nontonal and modal songs with first grade students. In general these students did as well as students more conventionally trained, but there were almost no significant differences between experimental and control groups. They conclude that we can use these materials without confusing young students. Miller did find that excessive exposure to nontonal music (one-third of instruction time) probably inhibits a child's ability to sing tonal songs. Although not disagreeing with their conclusions, we conclude that maturation and aptitude remain larger factors than instruction.

This article would be incomplete without a list of the summaries of recent research which can be found in various publications. The list includes: Lehman,[83] Zimmerman,[84] Benner,[85] Duerksen,[86] Rainbow,[87] Gonzo,[88] Turrentine,[89] Klemish,[90] Schwadron,[91] Jellison,[92] Whybrew,[93] Deihl and Partchey,[94] Schneider,[95] and Colwell.[96] Examination of the titles of these articles will revlew that some are specialized lists and some are general and that much overlapping occurs, but enough information is offered to furnish a fairly complete guide to the field as it looks today.

Direction for the future. Having selectively reviewed research of the past ten years, we proceed with an attempt to establish a rationale for the conduct of research in music education during the next ten years.

Major research questions. These questions have been formulated to provide a focus for research pertinent to the establishment of music education as a partner in an overall program of aesthetic education. The questions do not encompass research into the history of music, the development of musical style, or other topics in the realm of musicology. They are concerned with the nature of musical responsiveness and perception and the means of developing them. They point toward basic research the results of which may later be applied to music teaching and learning.

(1) What is music as art?
(2) What constitutes aesthetic responsiveness to music?
(3) How does aesthetic responsiveness to music relate to aesthetic responsiveness to other arts?
(4) What is the basis for aesthetic responsiveness to music?
(5) What is the basis for musical perception?
(6) What is the influence of aptitude on the development of musical responsiveness and perception?
(7) What is the influence of maturation on the development of musical responsiveness and perception?
(8) To what extent can a growth gradient be established for the development of musical responsiveness and perception?
(9) How can aptitude for musical responsiveness and perception be measured?
(10) How can achievement in musical responsiveness and perception be measured?

(11) How does achievement of performance skills, listening skills, and skill in analyzing compositional devices and stylistic characteristics affect the development of musical responsiveness and perception?
(12) What types of experience with music contribute to the development of musical responsiveness and perception?

It appears obvious that a program designed to find answers to questions such as these requires the collaboration of philosophers and scientists. Aesthetic theories represent potential sources of hypotheses pertinent to answering the first three questions. The hypotheses derived from aesthetic theory must be tested by the scientist and, if verified in the laboratory, can provide direction for research into the remaining questions. We close by establishing conditions under which research into questions such as these becomes feasible.

First, the research effort in music education must be focused on basic research designed to verify hypotheses and to establish a sound and comprehensive theory of music education. The present unsubstantial character of all aspects of the music program other than performance is largely due to hasty, enthusiastic, but often misguided, efforts to apply unsubstantiated theory to practice.

Second, the research must exhibit the quality of continuity possible only in an ongoing program with a group of researchers involved. SWRL and Gordon's program at the University of Buffalo exhibit this characteristic to an extent, but additional centers are needed. A few major universities with large doctoral programs and competent research personnel are in a position to establish such a program contingent on the availability of funds, and it would be feasible to establish consortiums of two or more universities having significant resources for research. The function of CEMREL could be altered to serve as a coordinating agency for a group of individual researchers working in their own institutions.

Third, a program of basic research requires consistent and dependable funding. Commitment of funds for a minimum of three years is essential. Short-term commitments inevitably lead to trivial results due both to pressure on the researcher to show quick results and the fact that it is next to impossible for a researcher to gain real relief from administrative and teaching assignments on a short term basis.

Fourth, it is essential that a corps of professional researchers be developed, and such personnel can be supplied only when there is a reasonable prospect of a continuing demand for their expertise. Currently there is little motivation for a music education faculty member to develop research competence and become involved in ongoing research since it is apparent that he will be evaluated on his performance in supervising student teachers, conducting a band or administering instructional programs. It must be emphasized, however, that doctoral programs in this country have over the past few years produced an impressive cadre of competent researchers who have the potential for becoming members of a professional research corps. Financial support is the essential ingredient that is missing.

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